
BMP Retrofit Pilot Projects

Quarterly Status Report No. 8

BMP Retrofit Pilot Projects in District 7 and District 11

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INTRODUCTION

Background and Purpose

Periodic status reports and meetings are specified in the District 7 and District 11 Scoping Study as a vehicle to update NRDC, EPA, San Diego Baykeeper, and Santa Monica Baykeeper on the progress of the BMP Retrofit Pilot Program and receive input as to appropriate changes or modifications to the program. The bi-weekly and quarterly status meetings have been scheduled on a regular basis to coincide with general project milestones and periods of significant activity. Approximate scheduled dates for the periodic status meetings are given in the Scoping Study. This report provides background documentation for the eighth status meeting to be held on March 15, 2000.

The scope of the status reports includes a general program-level overview of the activities that precede the status meetings. Status reports include information regarding the Pilot Program 1) remaining construction, 2) OMM activities and sampling issues, 3) vector and biological issues, and 4) other issues pertaining to the pilot study. The program Master Schedule is contained in the Scoping Study for each District. An updated schedule is contained with this Status report.

The preceding Status Meeting (No. 7) was held on December 15, 1999. The meeting minutes are included as Appendix A. The main issues discussed at Status Meeting No. 7 included the following:

- Non-stormwater Discharges
- Design/Construction status for remaining sites in District 7
- Vector Issues
- Environmental/Biological Issues
- Specific Device Issues
- OMM Activities
- O&M Cost Summary
- Cost Workgroup/Cost Data Preparation

The project calendar listing meetings and submittals scheduled for the next few months is included as Appendix H.

QUARTERLY STATUS REPORT SITE STATUS SUMMARY

Location	BMP Type	Site ID	OMM Consultant	District Review	Construction Phase	Instrumentation Phase	Monitoring Phase
DISTRICT 7							
I-605/SR-91	IB	73101	MW/Law				X
I-210 E. of Orcas	CDS	73102	MW/Law		X		
I-210 E. of Filmore	CDS	73103	MW/Law		X		
I-5/I-605	EDB	74101	BC				X
I-605/SR-91	EDB	74102	BC				X
Paxton Park & Ride	MF	74103	BC	X			
Metro MS	MCTT	74104	BC	X			
Alameda MS	OWS	74201	BC				X
Eastern MS	MF	74202	BC				X
Foothill MS	MF	74203	BC				X
Termination P&Ride	MF	74204	BC				X
Via Verde Park&Ride	MCTT	74206	BC				X
Lakewood Park&Ride	MCTT	74208	BC				X
Altadena MS	Bio Strip/IT	73211a,b	MW/Law				X
Foothill MS	DII	73216	MW/Law				X
LasFlores MS	DII	73217	MW/Law				X
Rosemead MS	DII	73218	MW/Law				X
I-605/SR-91	Bio Strip/Swale	73222a,b	MW/Law				X
Cerritos MS	BioSwale	73223	MW/Law				X
I-5/I-605	BioSwale	73224	MW/Law				X
I-605/ Del Amo	BioSwale	73225	MW/Law				X
DISTRICT 11							
I-5/SR-56	EDB	111101	KLI				X
I-15/SR-78	EDB	111102	KLI				X
I-5/La Costa (West)	IB	111103	KLI				X
I-5/La Costa (East)	WB	111104	KLI				X
I-5/Manchester (East)	EDB	111105	KLI				X
Kearney Mesa MS	MF(StormFilter)	112201	KLI				X
Escondido MS	MF	112202	KLI				X
La Costa Park & Ride	MF	112203	KLI				X
SR-78/I-5 Park&Ride	MF	112204	KLI				X
Melrose Ave/SR-78	Bio Swale	112205	KLI				X
I-5 Palomar Airport Rd	Bio Strip	112206	KLI				X
Carlsbad MS	Bio Strip/IT	112207a,b	KLI				X

NON-STORMWATER RUNOFF INSPECTIONS

Weekly inspections have been performed at the sites where non-stormwater runoff was previously noted. The following table summarizes when non-stormwater runoff were noted at the sites inspected. **Non-stormwater Weekly Inspections have been discontinued at all locations. Should non-stormwater discharge be noted during routine inspections, weekly non-stormwater discharge inspections will resume.**

Week of	Brown and Caldwell Sites – D7				Law Crandall Sites – D7					KLI Sites – D11						
	Foothill MS: SF	Alameda MS: OWS	5/605 EDB	Via Verde: MCTT	Foothill MS: DII	Las Flores MS: DII	Rosemead MS: DII	605/91: IB	Altadena MS: Strip/IT	15/78 EDB	Escondido MS: SF II	5/78 P&R: MF	5/56 EDB	Kearny Mesa MF	Palomar Bioswale	Carlsbad MS
July 12	N	-	-	-	N	N	N	N	Y	-	-	-	-	-	-	-
July 19	N	-	-	-	N	N	N	Y	Y	-	-	-	-	-	-	-
July 26	N	-	-	-	N	N	N	Y	Y	-	-	-	-	-	-	-
Aug 2	Y	-	-	-	Y	N	N	N	N	N	N	Y	Y	N	-	-
Aug 9	N	Y	Y	Y	N	N	N	N	Y	Y	N	Y	Y	N	-	-
Aug 16	N	N	Y	N	N	D	D	Y	Y	Y	N	N	Y	N	Y	-
Aug 23	Y	N	Y	N	Y	D	D	N	N	N	N	N	Y	N	Y	-
Aug 30	Y	N	N	N	N	D	D	N	Y	N	-	N	Y	N	Y	N
Sept 6	Y	N	Y	N	N	D	D	N	Y	N	Y	N	Y	-	Y	N
Sept 13	N	N	N	N	N	D	D	N	N	N	N	N	Y	-	Y	N
Sept 20	N	N	N	Y	N	D	D	N	N	N	N	N	Y	-	Y	N
Sept 27	N	N	N	Y	N	D	D	N	N	N	N	N	Y	-	Y	N
Oct 4	N	N	N	N	N	D	D	N	N	N	N	N	Y	N	Y	N
Oct 11	D	D	D	N	D	D	D	D	D	D	D	D	Y	N	N	D
Oct 18	D	D	D	N	D	D	D	D	D	D	D	D	Y	N	N	D
Oct 25	D	D	D	D	D	D	D	D	D	D	D	D	Y	N	Y	D
Nov 1	D	D	D	D	D	D	D	D	D	D	D	D	Y	D	Y	D
Nov 8	D	D	D	D	D	D	D	D	D	D	D	D	Y	D	Y	D
Nov 15	D	D	D	D	D	D	D	D	D	D	D	D	Y	D	Y	D
Nov 22	D	D	D	D	D	D	D	D	D	D	D	D	Y	D	Y	D
Nov 29	D	D	D	D	D	D	D	D	D	D	D	D	Y	D	Y	D
Dec 6	D	D	D	Y	D	D	D	D	D	D	D	D	Y	D	Y	D
Dec 13	D	D	D	N	D	D	D	D	D	D	D	D	Y	D	N	D
Dec 20	D	D	D	N	D	D	D	D	D	D	D	D	N	N	N	D
Dec 30	D	D	D	N	D	D	D	D	D	D	D	D	N	N	N	D
Jan 4/00	D	D	D	N	D	D	D	D	D	D	D	D	N	N	N	D
Jan 10/00	D	D	D	D	D	D	D	D	D	D	D	D	Y	N	N	D
Jan. 17,00	D	D	D	D	D	D	D	D	D	D	D	D	N	D	D	D
Jan. 24,00	D	D	D	D	D	D	D	D	D	D	D	D	N	D	D	D
Jan. 31,00	D	D	D	D	D	D	D	D	D	D	D	D	N	D	D	D
Feb. 7, 00	D	D	D	D	D	D	D	D	D	D	D	D	N	D	D	D
Feb. 14 00	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

N – No evidence of non-stormwater runoff discharged into BMP

Y – Non-stormwater runoff was observed

- – No Inspection was held during the week.

D – Discontinued Inspections (no non-stormwater discharge observed previous 4 weeks)

o – Has not been conducted at the time of preparation of this report.

**ACTIVITY DESCRIBED IN THIS QUARTERLY REPORT COVERS THE PERIOD FROM
DECEMBER 3, 1999 – MARCH 1, 2000**

District 7 BMP Pilot Sites

I-605/SR-91 Interchange Infiltration Basin (Site ID 73101) MW/Law

Monitoring/Sampling Activities

- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.52 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/16/00: Checked functionality of bubbler. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/25/00: Storm produced 0.55 inch of rainfall. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams were mobilized because of the unlikelihood of rainfall producing enough runoff to cause water to pool in the infiltration basin.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.26 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.14 inches of rainfall in a 2 to 3 hour period. A team was mobilized to make empirical observations of the infiltration basin.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.62 inch of rainfall. A team was mobilized to make empirical observations of the infiltration basin.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.14 inches of rainfall. A team was mobilized to make empirical observations of the infiltration basin.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 0.98 inch of rainfall. Teams were not mobilized because empirical observations were already made during this week's wet period.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 2 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.16 inch of rainfall. A team was mobilized to make empirical observations of the infiltration basin.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.09	N	N	NA	NA	N
12/31/99	0.52	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	NA	NA	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.26	N	N	NA	NA	N
2/12-14/00	1.14	Y	Y	NA	NA	Y
2/16/00	0.62	Y	Y	NA	NA	Y
2/20-21/00	2.14	Y	Y	NA	NA	Y
2/23/00	0.98	N	N	NA	NA	N
2/27/00	0.16	Y	Y	NA	NA	Y

Operations and Maintenance

- 12/2/99: Began scarifying infiltration basin in preparation of hydroseed.
- 12/3/99: Completed scarifying of infiltration basin in preparation of hydroseed.
- 12/10/99: Infiltration basin was hydroseeded.
- 1/6/00: Conducted monthly/post-storm inspection. Observation of the overflow structure indicates that flow entered the structure and then discharged directly into the infiltration basin. The infiltration basin was dry during the post-storm inspection. An area of erosion was observed on the northern side of the infiltration basin where flow concentrates through a swale on the access road. The erosion consists of a rut 4-5 inches deep, 3-4 inches wide from the top to bottom of the side. The area of erosion was repaired on 1/10/00 by filling in the rut with soil. Hydroseed has begun to sprout in some areas. Burrows were found in the infiltration.
- 1/10/00: The area of erosion was repaired by backfilling and compacting the rut. Burrows were filled in.
- 1/11/00: Hydroseed was inspected by Margot Griswold.
- 1/25/00: Erosion was observed on the north side slope (same area that previously eroded and was repaired). This area is immediately beneath an asphalt depression on the access road. Erosion was repaired on 2/2/00. Flow discharged into the infiltration basin through the 12-inch pipe on the east side; flow did not discharge into the infiltration

- basin through the 24-inch pipe in the southeast corner. Runoff ponded in isolated pools and then infiltrated.
- 2/2/00: Repaired erosion on the north side slope. Sandbags were placed at the end of the asphalt depression above the eroded area to prevent future erosion.
- 2/9/00: Conducted monthly site inspections. Hydroseed is growing on approximately 35 percent of the floor and 20 percent of the slopes. Some trash was removed from the site.
- 2/10/00: Trash and debris were removed and gopher burrows were filled in.
- 2/12/00: Approximately 4 to 5 inches of runoff collected within the infiltration basin. Some bypass was observed through the overflow structure because the intense rainfall created runoff with a flow level that exceeded the weir plate elevation.
- 2/16/00: Approximately 0.4 inch of runoff collected within the infiltration basin. No bypass was observed through the overflow structure.
- 2/20/00: Approximately 4.5 inches of runoff collected within the infiltration basin. Some bypass was observed through the overflow structure because the intense rainfall created runoff with a flow level that exceeded the weir plate elevation.
- 2/27/00: Runoff discharged into the infiltration basin but not enough to cause ponding water. No bypass was observed through the overflow structure.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None.

I-210/East Orcas Avenue Continuous Deflection Separators (Site ID 73102)

MW/Law

Status

First day of construction was Jan. 28, 2000. As of Feb. 29, 2000, 10 days were lost due to weather, and one day due to a State Holiday (see schedule below). Construction is 20% complete.

Issues / Solutions

Following the storm on Feb. 20, the existing v-ditch was full of runoff and clogged due to accumulated debris. The v-ditch was subsequently cleaned out by Caltrans Maintenance. No construction delays occurred since this happened during non-working days (due to weather).

I-210/East of Filmore Street Continuous Deflection Separators (Site ID 73103)
MW/Law

Status

First day of construction was Jan. 28, 2000. As of Feb. 29, 2000, 10 days were lost due to weather, and one day due to a State Holiday (see schedule below). Construction is 20% complete.

Issues / Solutions

The Contractor pointed out that the gate in the perimeter security fence is located such that the OM&M Personnel will need to step over the CMP Pipe (which is above grade) to access the BMP. A Change Order was prepared to move the gate to the other side of the fence. There is no additional cost or schedule change as a result.

Design/Construction Schedule for CDS Units – PS&E Process

Activities	Revised Scheduled Dates	Actual Dates	Duration (calendar weeks)
Obtain EA	06/01/99	06/04/99	
Begin Clearance	06/21/99	06/28/99	
Obtain District Clearances/To Santa Ana	07/26/99	09/14/99	4
End Santa Ana Review, Advertise, and Bid Opening	12/07/99	11/16/99	12
Award Contract	12/14/99	12/14/99	4
Begin Construction	02/01/00	01/28/00	4
Complete Construction	04/13/00		8
Fully Operational	04/27/00		2

I-5/I-605 Extended Detention Basin Lined (Site ID 74101) BC

See Page12 for general comments applicable to all Brown and Caldwell Sites.

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled completely and went to bypass condition.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.17	N	N	NA	NA	N
12/31/99	0.21	N	N	NA	NA	N
1/16/00	0.01	N	N	NA	NA	N
1/25/00	0.56	Y	Y	N	N	Y
1/30-31/00	0.35	N	N	NA	NA	N
2/10-11/00	0.51	N	N	NA	NA	N
2/12-14/00	0.98	N	N	NA	NA	N
2/16/00	0.65	N	N	NA	NA	N
2/20-21/00	2.29	Y	Y	Y	Y	Y
2/23/00	1.06	N	N	NA	NA	N
2/27/00	0.21	Y	Y	Y	Y	Y

Vector Activities

None noted during routine inspection.

Operation and Maintenance

December 6: Monthly site inspection was conducted for December; a small section of the barrier tape designating the BMP boundary was replaced.

January 4: Monthly site inspection was conducted for January; a small section of damaged barrier tape designating BMP boundary was replaced; standing water was pumped from the outlet structure.

January 28: Monthly inspection was performed for the month of February. Vegetation growth is exceeding 18 inches in some areas and will be trimmed per MID.

February 2: Standing water in the effluent riser pumped out. Trash and debris were removed. Barrier tape replaced where necessary.

Issues/Solutions

None this period.

I-605/SR-91 Extended Detention Basin – Unlined (Site ID 74102) BC

See Page 12 for general comments applicable to all Brown and Caldwell Sites.

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially but did not bypass; the influent datalogger battery was damaged due to leakage, but did not sustain irrecoverable data loss; the effluent flow meter failed during this storm, therefore did not analyze samples.

February 27: Successfully captured storm; very little effluent at this site due to low rain volume and subsequent low volume runoff; also sediment deposition is a problem at the influent site during small volume storms.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.08	N	N	NA	NA	N
12/31/99	0.41	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.48	Y	Y	N	N	Y
1/30-31/00	0.18	N	N	NA	NA	N
2/10-11/00	0.46	N	N	NA	NA	N
2/12-14/00	1.07	N	N	NA	NA	N
2/16/00	0.45	N	N	NA	NA	N
2/20-21/00	1.73	Y	Y	Y	Y	Y
2/23/00	0.19	N	N	NA	NA	N
2/27/00	0.04	Y	Y	Y	Y	Y

Operation and Maintenance

December 3: Monthly site inspection was conducted for December; a small section of the barrier tape designating BMP boundary was replaced.

January 4: Monthly site inspection was conducted for January.

January 28: Monthly inspection was performed for the month of February. Evidence of gopher holes were found.

February 2: Trash and debris were removed.

Vector Activities

None noted during routine inspection.

Issues/Solutions

Sediment easily accumulates at the influent sampling site and is a frequent maintenance problem during small volume storms. We will maintain vigilance while sampling during these conditions.

Paxton Maintenance Station Media Filter (Site ID 74103) BC

Metro Maintenance Station Multi-Chamber Treatment Train (Site ID 74104) BC

Status

Both Paxton and Metro plans and specifications are moving forward to District clearance. A partial package submittal of revised PS&E packages from Brown and Caldwell was submitted to D7OE and HQ on Feb 16, 2000. Cost estimates will be submitted on March 6.

Schedule

Design/Construction Schedule for Paxton PR Media Filter and Metro MS MCTT

Activities	Scheduled	Actual	Duration
Obtain EA	06/01/99	07/15/99	
Begin Clearance Process	06/28/99	07/16/99	
Obtain District Clearances/to Dist OE	02/25/00	To be revised	
Obtain District OE Approval/to HQ	04/07/00	To be revised	
End HQ Review, Advertise & Bid Opening	05/28/00		12
Award Contract	06/19/00		4
Begin Construction	07/03/00		4
Complete Construction	10/30/00		16
Fully Operational	11/24/00		2

General Comments Applicable to Brown and Caldwell Sites

The storm of Tuesday, January 25, 2000 was not successfully captured. Sufficient volume for laboratory analyses was not collected. Based upon the predicted intensity and length of the forecasted storm, BMP sampling parameters were set for conditions that did not occur. The majority of rainfall occurred in the first three hours of the morning, while the predicted duration was for a full day of steady rainfall. Because intensity and duration expectations were far from actual, sampling parameters could not be adjusted accordingly in time to capture viable samples. The sampling effort was aborted after determining that the majority of the storm had passed and that the captured influent sample volumes were not adequate to conduct minimal analyses. Empirical observations were recorded for this event at each BMP.

Future storms were approached more conservatively by adjusting the sampling parameters to less-than-predicted intensities (oversampling in case of short-lived events). In this manner, if storm forecast predictions hold true, oversampling will occur, but percent capture will be maximized for each storm.

The two storms that followed, and met the sampling criteria, were successfully sampled, with the exception of I-605/SR-91. In this instance, during the February 20 – 21 event, the Sigma bubbler at the effluent site failed. American Sigma has been contacted and the bubbler is going to be sent in for evaluation/repair. Subsequently, a spare was put in place and the next storm was captured.

All data has been downloaded and will be analyzed. Only the cumulative rainfall totals have been reported for this quarterly update. A summary table is included for each site.

Alameda Maintenance Station Oil/Water Separator (Site ID 74201) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.38	N	N	NA	NA	N
12/31/99	0.11	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.51	Y	Y	N	N	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.31	N	N	NA	NA	N
2/12-14/00	1.05	N	N	NA	NA	N
2/16/00	0.79	N	N	NA	NA	N
2/20-21/00	1.73	Y	Y	NA *	Y	Y
2/23/00	1.4	N	N	NA	NA	N
2/27/00	0.2	Y	Y	NA *	Y	Y

* The Alameda site is an Oil/Water Separator and does not have a composite sampler (as do the other BMP's).

Operation and Maintenance

December 3: Monthly site inspection was conducted for December; debris and sediment in the trench drain were removed and sediment was stockpiled in a drum on site.

January 4: Monthly site inspection was conducted for January.

January 28: Monthly inspection was performed for the month of February.

February 4: Sediment in the trench drain was removed and placed in the onsite containment drum. Trash and debris were removed.

Vector Activities

None noted during routine inspection.

Issues/Solutions

None this period.

Eastern Regional Maintenance Station Media Filter (Site ID 74202) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially and went into bypass.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.15	N	N	NA	NA	N
12/31/99	0.27	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.71	Y	Y	N	N	Y
1/30-31/00	0.2	N	N	NA	NA	N
2/10-11/00	0.49	N	N	NA	NA	N
2/12-14/00	1.51	N	N	NA	NA	N
2/16/00	0.72	N	N	NA	NA	N
2/20-21/00	2.35	Y	Y	Y	Y	Y
2/23/00	1.44	N	N	NA	NA	N
2/27/00	0.33	Y	Y	Y	Y	Y

Operation and Maintenance

December 6: Monthly site inspection was conducted for December; preventive maintenance was performed on the wooden cover over the sampling box (longer deck screws were used to hold the sections together).

January 4: Monthly site inspection was conducted for January.

January 31: Monthly inspection was performed for the month of February.

February 2: Stand pipe in the sediment chamber was cleared of material that slowed the flow of water into the media filter.

Vector Activities

None noted during routine inspection.

Issues/Solutions

None this period.

Foothill Maintenance Station Media Filter (Site ID 74203) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially and went into bypass.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.1	N	N	NA	NA	N
12/31/99	0.28	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.68	Y	Y	N	N	Y
1/30-31/00	0.34	N	N	NA	NA	N
2/10-11/00	0.78	N	N	NA	NA	N
2/12-14/00	1.42	N	N	NA	NA	N
2/16/00	0.91	N	N	NA	NA	N
2/20-21/00	2.95	Y	Y	Y	Y	Y
2/23/00	1.59	N	N	NA	NA	N
2/27/00	0.49	Y	Y	Y	Y	Y

Operations and Maintenance

December 6: Monthly site inspection was conducted for December; preventive maintenance was performed on the wooden covers over the sampling boxes (longer deck screws were used to hold the sections together).

January 4: Monthly site inspection was conducted for January.

February 1: Monthly inspection was performed for the month of February.

February 1: Weeds were pulled; trash and debris were removed.

Vector Activities

None noted during routine inspection.

Issues / Solutions

On December 30, BC re-installed the ultrasonic level sensor in the influent pipe, after the unit was returned from American Sigma. (BC had previously sent the unit in for evaluation/repair). Level calibration was performed and the unit appears to be functioning correctly.

Termination Park and Ride Media Filter (Site ID 74204) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially and went into bypass.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.15	N	N	NA	NA	N
12/31/99	0.10	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.61	Y	Y	N	N	Y
1/30-31/00	1.13	N	N	NA	NA	N
2/10-11/00	0.21	N	N	NA	NA	N
2/12-14/00	0.95	N	N	NA	NA	N
2/16/00	0.66	N	N	NA	NA	N
2/20-21/00	2.16	Y	Y	Y	Y	Y
2/23/00	1.01	N	N	NA	NA	N
2/27/00	0.15	Y	Y	Y	Y	Y

Operation and Maintenance

December 6: Monthly site inspection was conducted for December; preventive maintenance was performed on the wooden covers over the sampling boxes (longer deck screws were used to hold the sections together), also broken glass was removed from the site.

January 4: Monthly site inspection was conducted for January.

January 28: Monthly inspection was performed for the month of February.

January 31: Weeds, trash, and debris were picked up from the facility.

Vector Activities

None noted during routine inspection.

Issues/Solutions

None this period.

Via Verde Park and Ride Multi-Chamber Treatment Train (Site ID 74206) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially and went into bypass.

February 27: Captured the storm; may not have sufficient percent recovery for the effluent.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.14	N	N	NA	NA	N
12/31/99	0.35	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.88	Y	Y	N	N	Y
1/30-31/00	0.34	N	N	NA	NA	N
2/10-11/00	0.9	N	N	NA	NA	N
2/12-14/00	1.02	N	N	NA	NA	N
2/16/00	1.15	N	N	NA	NA	N
2/20-21/00	2.52	Y	Y	Y	Y	Y
2/23/00	1.47	N	N	NA	NA	N
2/27/00	0.4	Y	Y	Y	Y	Y

Operation and Maintenance

December 6: Monthly site inspection was conducted for December; debris and trash were collected and removed from the site.

December 30: The effluent sump pump was removed due to an apparent malfunction. Upon inspection, debris in the impeller was removed which restored proper pump operation.

January 5: Monthly site inspection was conducted for January.

January 28: Monthly inspection was performed for the month of February.

February 1: Trash and debris were removed.

Vector Activities

January 27: Breeding found and treated with Golden Bear oil.

Issues/Solutions

On December 6 a broken irrigation sprinkler was discharging water into the BMP. Caltrans was notified and weekly non-stormwater inspections were initiated. No further incidences were noted and weekly monitoring was discontinued.

The effluent sump pump malfunctioned and was removed and replaced with a spare on February

Lakewood Park and Ride Multi-Chamber Treatment Train (Site ID 74208) BC

Monitoring/Sampling Activities

No sampling activities took place during December through January 11, 2000.

December 31: No teams were mobilized because Caltrans deemed sampling unsafe during the holidays.

January 25: Mobilized but did not obtain samples; empirical observations were taken.

January 27: Post-storm inspections were conducted.

February 20 – 21: Successfully captured storm; the basin filled substantially and went into bypass.

February 27: Successfully captured storm.

Monitoring Summary

Date	Rainfall Total	Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.17	N	N	NA	NA	N
12/31/99	0.06	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.53	Y	Y	N	N	Y
1/30-31/00	0.32	N	N	NA	NA	N
2/10-11/00	0.34	N	N	NA	NA	N
2/12-14/00	0.46	N	N	NA	NA	N
2/16/00	0.55	N	N	NA	NA	N
2/20-21/00	1.89	Y	Y	Y	Y	Y
2/23/00	1.06	N	N	NA	NA	N
2/27/00	0.14	Y	Y	Y	Y	Y

Operation and Maintenance

December 6: Monthly site inspection was conducted for December; debris and trash were collected and removed from the site.

January 4: Monthly site inspection was conducted for January.

January 28: Monthly inspection was performed for the month of February. The transfer pump from the sediment chamber failed and was removed and replaced with a spare, after the standing water was pumped out.

January 31: Trash and debris were removed.

Vector Activities

December 17, 1999: Breeding noted; site abated with Altosid pellets.

January 11, 2000: Breeding noted; site abated with Altosid pellets.

February 3, 2000: Breeding noted: site abated with Altosid liquid.

February 10, 2000: Breeding noted; site abated with Altosid liquid.

February 29, 2000: Breeding noted; site abated with Altosid liquid.

Issues/Solutions

A malfunctioning pump was removed and replaced on January 28.

Altadena Maintenance Station Bio Strip and Infiltration Trench (Site ID 73211 a, b) MW/Law

Monitoring/Sampling Activities

- 12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.
- 12/9/99: Samplers were programmed for forecasted storm and flumes were cleaned.
- 12/16/99: During the data download, the Troll 4000 pressure transducer was not functioning properly. According to the manufacturer, an updated firmware program needs to be uploaded to the unit.
- 12/21/99: Attempted to upload new firmware program to pressure transducer but it did not work. After consultation with the manufacturer, it was decided to return the unit for repair. In-Situ, Inc. agreed to send a loaner unit. Subsequently, the Troll 4000 pressure transducer was removed from the monitoring well.
- 12/22/99: Installed, programmed, and calibrated loaner pressure transducer. Unit is functioning properly.
- 12/29/99: Checked functionality of the pressure transducer. No problems encountered.
- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/3/00: Auto samplers collected samples, but because some holding times were exceeded, Caltrans opted not to analyze the samples. Decontaminated sample bottles were placed in the samplers.
- 1/7/00: Flumes were cleaned.
- 1/15/00: Samplers were programmed for forecasted storm and checked functionality of pressure transducer.
- 1/16/00: Forecasted storm produced 0.04 inch of rain. No crews were mobilized.
- 1/18/00: Obtained a new set of keys from the maintenance station supervisor.
- 1/24/00: Samplers were programmed for forecasted storm and flumes were cleaned.
- 1/25/00: Storm produced 0.45 inch of rainfall. Grab and composite samples were collected at both the influent and effluent locations and sent to the laboratory for analysis. Influent and effluent samples represented 86% and 95% storm capture, respectively, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.83 inch of rainfall. No teams

were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration strip.

- 2/4/00: While attempting to download the Troll 4000 pressure transducer, it was observed not to be functioning properly. According to the manufacturer, there is a software problem with this loaner unit. The loaner unit was replaced on 2/7/00.
- 2/7/00: Installed, programmed, and calibrated repaired pressure transducer. Unit is functioning properly.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.27 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 0.76 inch of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.90 inch of rainfall. Teams were mobilized because the 48-hour antecedent dry period was met. Composite samples were collected at both the influent and effluent locations and sent to the laboratory for analysis. Influent and effluent samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 3.11 inches of rainfall. Teams were mobilized and composite samples were collected at both the influent and effluent locations and sent to the laboratory for analysis. Influent and effluent samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 1.84 inches of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.77 inch of rainfall. Teams were mobilized and composite and grab samples were collected at both the influent and effluent locations and sent to the laboratory for analysis. Influent and effluent samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.19	N	N	NA	NA	N
12/31/99	0.25	N	N	NA	NA	N
1/16/00	0.04	N	N	NA	NA	N
1/25/00	0.45	Y	Y	Y	Y	Y
1/30-31/00	0.83	N	N	NA	NA	N
2/10-11/00	0.27	N	N	NA	NA	N
2/12-14/00	0.76	N	N	NA	NA	N
2/16/00	0.90	Y	Y	Y	N	Y
2/20-21/00	3.11	Y	Y	Y	N	Y
2/23/00	1.84	N	N	NA	NA	N
2/27/00	0.77	Y	Y	Y	Y	Y

Operations and Maintenance

- 12/8/99: Sampled sediment, which had been removed from the spreader ditch and drummed.
- 12/20/99: Watered strip in accordance with Margot Griswold's recommended schedule.
- 1/3/00: Conducted monthly/post-storm inspection. Based on observations and flow measurements, flow passed through the entire strip and discharged into the infiltration trench. No channelization or ponding was observed. The infiltration trench was observed to be dry during the inspection. The spreader ditch was full of water.
- 1/7/00: Anticipating the acceptance of the newly developed MID, the spreader ditch was de-watered. Some trash and debris was removed from the strip and spreader ditch.
- 1/19/00: Drained spreader ditch; runoff was produced during 1/16-17/00 storm event (0.04 inch rainfall total).
- 1/25/00: Flow passed through the entire strip and discharged into the infiltration trench. No channelization or ponding was observed. Of note, earthworms were flooded from the biofilter and then discharged into the collector ditch.
- 1/26/00: Drained spreader ditch.
- 2/2/00: Drained spreader ditch; runoff was produced during 1/30/00 storm event.

- 2/11/00: Conducted monthly site inspection and drained standing water in spreader ditch, which was from the 2/11/00 event.
- 2/16/00: Flow passed through the entire strip and discharged into the infiltration trench. No channelization or ponding was observed. During a 5-minute period of the storm, rainfall intensity was so great that it caused runoff from the maintenance yard to sheetflow directly into the collector ditch.
- 2/18/00: Drained spreader ditch; runoff was produced during 2/16/00 storm event.
- 2/20/00: Flow passed through the entire strip and discharged into the infiltration trench. No channelization or ponding was observed.
- 2/24/00: Drained spreader ditch; runoff was produced during 2/23/00 storm event.
- 2/27/00: Flow passed through the entire strip and discharged into the infiltration trench. No channelization or ponding was observed. During a short period of the storm, rainfall intensity was so great that it caused runoff from the maintenance yard to sheetflow directly into the collector ditch.
- 2/29/00: Drained spreader ditch; runoff was produced during 2/27/00 storm event.

Vector Activities

December 10, 1999: Breeding noted in the spreader ditch; site abated with Altosid.

Issues / Solutions

None

Foothill Maintenance Station Drain Inlet Insert (StreamGuard and Fossil Filter Inserts) (Site ID 73216 a, b) MW/Law

Monitoring/Sampling Activities

12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.

- 12/9/99: Samplers were programmed for forecasted storm and flumes were cleaned.
- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.28 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/4/00: Auto samplers collected samples during 12/31/99 event, but because some holding times were exceeded, Caltrans opted not to analyze the samples. Decontaminated sample bottles were placed in the samplers. Flumes were cleaned and flow meters were checked and adjusted.

- 1/15/00: Samplers were programmed for forecasted storm and flumes were cleaned.
- 1/16/00: Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/19/00: Re-attached west edge of rubber monitoring vault berm.
- 1/24/00: Samplers were programmed for forecasted storm and flumes were cleaned.
- 1/25/00: Storm produced 0.65 inch of rainfall. Composite samples were collected at both the Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples represented 100% storm capture and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 1/30/00: Samplers were programmed for forecasted storm and flumes were cleaned. Storm produced 0.31 inch of rainfall. Composite samples were collected at both the Fossil Filter and StreamGuard DII locations. Fossil Filter and StreamGuard DII samples represented 98% and 89% storm capture, respectively, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 1/31/00: Samples sent to laboratory for analysis and monitoring stations readied for next storm event.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.79 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.34 inches of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.92 inch of rainfall. Teams were mobilized because the 48-hour antecedent dry period was met and because inspection during the storm is required per the MID. Composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 3.05 inches of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 1.60 inches of rainfall. No teams were mobilized because they inspected the sites earlier during this week's extended wet period.

2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.48 inch of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.10	N	N	NA	NA	N
12/31/99	0.28	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.65	Y	Y	Y	NA	Y
1/30-31/00	0.31	Y	Y	Y	NA	Y
2/10-11/00	0.79	N	N	NA	NA	N
2/12-14/00	1.34	N	N	NA	NA	N
2/16/00	0.92	Y	Y	Y	NA	Y
2/20-21/00	3.05	Y	Y	Y	NA	Y
2/23/00	1.60	N	N	NA	NA	N
2/27/00	0.48	Y	Y	Y	NA	Y

Operations and Maintenance

12/9/00: Conducted pre-storm inspection of DIIs. Trash and debris were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.

1/4/00: Conducted monthly/post-storm inspection. Sediment accumulated in the Fossil Filter DII blocking the filter cartridge. DII was subsequently cleaned during the post-storm inspection. Some sediment and leaves accumulated in the StreamGuard DII, however, no maintenance was required.

1/15/00: Conducted pre-storm inspection of DIIs. No maintenance was required.

1/24/00: Conducted pre-storm inspection of DIIs. Trash was removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.

- 1/25/00: Organic matter accumulated in the Fossil Filter DII blocking the filter cartridge causing flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Bypass did not occur after cleaning. Some leaves accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 1/30/00: Conducted pre-storm inspection of DIIs. Some debris was removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 1/30/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and sediment accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 2/11/00: Conducted monthly site inspection, which also addressed pre-storm inspection for the 2/12/00 forecasted event. Some debris was removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 2/16/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and sediment accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 2/17/00: Conducted pre-storm inspection of DIIs. Some leaves and sediment were removed from the Fossil Filter DII. Ponding water was observed in the StreamGuard DII but maintenance was not required.
- 2/18/00: Foss Environmental (StreamGuard DII distributor) was called to discuss the ponding water in the StreamGuard DII. A representative said that they would provide a letter stating that ponding water is typical and that no maintenance was required.
- 2/20/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge causing flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID, however, bypass continued because of the flow rate exceeding the capacity of the filter cartridges. Some leaves and sediment accumulated in the StreamGuard DII but maintenance was not required. Bypass was observed in the StreamGuard DII.
- 2/26/00: Conducted pre-storm inspection of DIIs. A small quantity of sediment was removed from the Fossil Filter DII. No ponding water was observed in the StreamGuard DII and no maintenance was required.
- 2/27/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge causing flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID; bypass was not observed after the DII was cleaned. Approximately 12 inches of ponding water was observed in the StreamGuard DII but bypass was not observed. No maintenance was required.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

Las Flores Maintenance Station Drain Inlet Insert (StreamGuard and Fossil Filter Inserts) (Site ID 73217 a, b) MW/Law

Monitoring/Sampling Activities

12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.

12/8/99: Re-attached rubber berms surrounding monitoring vaults.

12/9/99: Samplers were programmed for forecasted storm and flumes were cleaned.

12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.03 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.

1/3/00: Checked auto samplers and bottles; no samples collected. Flumes and flow meters were checked.

1/15/00: Samplers were programmed for forecasted storm and flumes were cleaned.

1/16/00: Forecasted storm produced 0.07 inch of rain. No crews were mobilized.

1/24/00: Samplers were programmed for forecasted storm and flumes were cleaned.

1/25/00: Storm produced 0.86 inch of rainfall. A composite sample was collected at the Fossil Filter DII location and sent to the laboratory for analysis. A composite sample was also collected at the StreamGuard DII location but not enough sample volume was obtained for laboratory analysis. The Fossil Filter DII sample represented 100% storm capture and enough volume was collected to run the entire analytical suite. Empirical observations were made.

1/30/00: Samplers were programmed for forecasted storm and flumes were cleaned. Storm produced 0.42 inch of rainfall. A composite sample was collected at the StreamGuard DII location. A composite sample was also collected at the Fossil Filter DII location but not enough sample volume was obtained for laboratory analysis. The StreamGuard DII sample represented 100% storm capture and enough volume was collected to run the entire analytical suite. Empirical observations were made.

1/31/00: Samples sent to laboratory for analysis and monitoring stations readied for next storm event.

- 2/4/00: Forecast predicted rain to produce 0.30 inch of rainfall with a 70% probability of occurrence in the Malibu area only. Samplers were programmed for forecasted storm and flumes were cleaned. Storm event produced 0.01 inch of rainfall. No team was mobilized
- 2/10/00: Forecast predicted rain to produce 0.10 inch of rainfall with a 40% probability of occurrence in the Malibu area only. Samplers were programmed for forecasted storm and flumes were cleaned. Storm event produced 0.45 inch of rainfall. Composite samples were collected at both the Fossil Filter and StreamGuard DII locations. Fossil Filter and StreamGuard DII samples represented 74% and 95% storm capture, respectively, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/11/00: Samples were sent to the laboratory for analysis.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.67 inches of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.48 inch of rainfall. Teams were mobilized because inspection during the storm is required per the MID. Samples were not collected from the DIIs because the 48-hour minimum antecedent dry period was not met. Empirical observations were made.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.38 inches of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 1.80 inches of rainfall. No teams were mobilized because they inspected the sites earlier during this week's extended wet period.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.50 inch of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.48	N	N	NA	NA	N
12/31/99	0.03	N	N	NA	NA	N
1/16/00	0.07	N	N	NA	NA	N
1/25/00	0.86	Y	Y	Y*	NA	Y
1/30-31/00	0.42	Y	Y	Y**	NA	Y
2/10-11/00	0.45	Y	Y	Y	NA	Y
2/12-14/00	1.67	N	N	NA	NA	N
2/16/00	0.48	N	Y***	NA	NA	Y
2/20-21/00	2.38	Y	Y	Y	NA	Y
2/23/00	1.80	N	N	NA	NA	N
2/27/00	0.50	Y	Y	Y	NA	Y

* Not enough sample collected from StreamGuard DII for analysis

** Not enough sample collected from Fossil Filter DII for analysis

*** Deployment criteria met; team mobilized to conduct during-storm inspection.

Operations and Maintenance

- 12/9/00: Conducted pre-storm inspection of DIIs. Sediment was removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.
- 1/7/00: Conducted monthly/post-storm inspection. Sediment accumulated in the Fossil Filter DII blocking the filter cartridge. DII was subsequently cleaned during the post-storm inspection. Some sediment and leaves accumulated in the StreamGuard DII, however, no maintenance was required.
- 1/15/00: Conducted pre-storm inspection of DIIs. Leaves were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.

- 1/24/00: Conducted pre-storm inspection of DIIs. Leaves were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.
- 1/25/00: Sediment and leaves accumulated in the Fossil Filter DII blocking part of the filter cartridge but bypass was not observed. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 1/30/00: Conducted pre-storm inspection of DIIs. Some leaves were removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 1/30/00: Sediment and leaves accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and sediment accumulated in the StreamGuard DII. The weight of the collected material caused the StreamGuard DII to fall into the drain inlet. Fortunately, there was no rain at the time the DII fell into the drain inlet and the monitoring team was able to remove the sediment and leaves from the DII and re-install it. No bypass was observed during the event.
- 2/7/00: Conducted pre-storm inspection of DIIs for 2/9/00 forecasted event. Some leaves were removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 2/10/00: Some leaves accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and sediment accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 2/11/00: Conducted monthly site inspection, which also addressed pre-storm inspection for the 2/12/00 forecasted event. Sediment was removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 2/16/00: Some leaves and sediment accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Flow bypass was observed at the StreamGuard DII and ponding water was observed in the StreamGuard DII following the event. No maintenance was required of the StreamGuard DII because the MID thresholds were not met.
- 2/18/00: Conducted pre-storm inspection of DIIs. Some leaves and sediment were removed from the Fossil Filter DII. Ponding water was observed in the StreamGuard DII but maintenance was not required. Foss Environmental (StreamGuard DII distributor) was called to discuss the ponding water in the StreamGuard DII. A representative said that they would provide a letter stating that ponding water is typical and that no maintenance was required.
- 2/20/00: Some organic matter accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during

the storm event in accordance with the MID. Some leaves and trash accumulated in the StreamGuard DII but maintenance was not required. Bypass was observed in the StreamGuard DII.

- 2/26/00: Conducted pre-storm inspection of DIIs. Some leaves and a small quantity of sediment were removed from the Fossil Filter DII. One inch of ponding water was observed in the StreamGuard DII but no maintenance was required.
- 2/27/00: Sediment accumulated in the Fossil Filter DII blocking the filter cartridge causing flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. No bypass was observed after the DII was cleaned. The east side of the StreamGuard DII came loose during the storm event allowing runoff from the east side to bypass the StreamGuard between the DII and drain inlet. Approximately 18 inches of ponding water was observed in the StreamGuard DII. Some leaves and trash accumulated in the StreamGuard DII but maintenance was not required.

Vector Activities

December 7, 1999: Altosid pellets applied to the monitoring vaults of the DIIs. No vector breeding was detected, but standing water was present in the monitoring vaults/flumes due to the consultant's normal pre-storm preparations. The LACWVCD was notified that abatement should only take place after vector breeding has been verified.

Issues / Solutions

None

Rosemead Maintenance Station Drain Inlet Insert (StreamGuard and Fossil Filter Inserts) (Site ID 73218 a, b) MW/Law

Monitoring/Sampling Activities

- 12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.
- 12/9/99: Samplers were programmed for forecasted storm and flumes were cleaned.
- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.34 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/4/00: Auto samplers collected samples during the 12/31/99 event, but because some holding times were exceeded, Caltrans opted not to analyze the samples. Decontaminated sample bottles were placed in the samplers. Flumes were cleaned and flow meters were checked and adjusted. The east side of the rubber berm surrounding the Fossil Filter monitoring vault was observed to be missing.

- 1/7/00: The Fossil Filter monitoring vault rubber berm was repaired.
- 1/15/00: Samplers were programmed for forecasted storm and flumes were cleaned.
- 1/16/00: Forecasted storm produced 0.01 inch of rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm and flumes were cleaned.
- 1/25/00: Storm produced 0.72 inch of rainfall. Composite samples were collected at both the Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples represented 100% storm capture and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 1/30/00: Samplers were programmed for forecasted storm and flumes were cleaned. Storm produced 0.21 inch of rainfall. Composite samples were collected at both the Fossil Filter and StreamGuard DII locations. Fossil Filter and StreamGuard DII samples represented 95% and 92% storm capture, respectively, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 1/31/00: Samples sent to laboratory for analysis and monitoring stations readied for next storm event.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.46 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.05 inches of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.90 inch of rainfall. Teams were mobilized because inspection during the storm is required per the MID. Samples were not collected from the DIIs because the 48-hour minimum antecedent dry period was not met. Empirical observations were made.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.65 inches of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 1.89 inches of rainfall. No teams were mobilized because they inspected the sites earlier during this week's extended wet period.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.46 inch of rainfall. Teams were mobilized and composite samples were collected at both Fossil Filter and StreamGuard DII locations and sent to the laboratory for analysis. Both samples

met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.12	N	N	NA	NA	N
12/31/99	0.34	N	N	NA	NA	N
1/16/00	0.01	N	N	NA	NA	N
1/25/00	0.72	Y	Y	Y	NA	Y
1/30-31/00	0.21	Y	Y	Y	NA	Y
2/10-11/00	0.46	N	N	NA	NA	N
2/12-14/00	1.05	N	N	NA	NA	N
2/16/00	0.90	N	Y*	NA	NA	Y
2/20-21/00	2.65	Y	Y	Y	NA	Y
2/23/00	1.89	N	N	NA	NA	N
2/27/00	0.46	Y	Y	Y	NA	Y

* Deployment criteria met; team mobilized to conduct during-storm inspection.

Operations and Maintenance

- 12/9/00: Conducted pre-storm inspection of DIIs. Trash and debris were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.
- 1/4/00: Conducted monthly/post-storm inspection. Sediment accumulated in the Fossil Filter DII blocking the filter cartridge. DII was subsequently cleaned during the post-storm inspection. Some sediment and leaves accumulated in the StreamGuard DII, however, no maintenance was required.
- 1/15/00: Conducted pre-storm inspection of DIIs. Leaves, sediment, and trash were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.
- 1/24/00: Conducted pre-storm inspection of DIIs. Trash and debris were removed from the Fossil Filter DII in accordance with the MID. No maintenance was required at the StreamGuard DII.

- 1/25/00: Some leaves, debris, and sediment accumulated in the Fossil Filter DII blocking part of the filter cartridge but bypass was not observed. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and debris accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 1/30/00: Conducted pre-storm inspection of DIIs. Leaves, sediment, and trash were removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 1/30/00: Leaves and debris accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Some leaves and sediment accumulated in the StreamGuard DII. No bypass occurred and no maintenance was required.
- 2/11/00: Conducted monthly site inspection, which also addressed pre-storm inspection for the 2/12/00 forecasted event. Leaves were removed from the Fossil Filter DII. No maintenance was required of the StreamGuard DII.
- 2/16/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. No bypass occurred and no maintenance was required of the StreamGuard DII.
- 2/17/00: Conducted pre-storm inspection of DIIs. Some leaves and sediment were removed from the Fossil Filter DII. Ponding water was not observed in the StreamGuard DII and maintenance was not required.
- 2/18/00: Foss Environmental (StreamGuard DII distributor) was called to discuss the ponding water in the StreamGuard DII. A representative said that they would provide a letter stating that ponding water is typical and that no maintenance was required.
- 2/20/00: Some organic matter accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. Later during the storm, flow bypass was observed because the flow rate exceeded the capacity of the filter cartridges. Some debris accumulated in the StreamGuard DII but maintenance was not required. Bypass was observed in the StreamGuard DII. On 2/21/00 at 13:00, flooding was observed (to a depth of approximately 4 inches) because the StreamGuard DII could not handle the flow rate.
- 2/26/00: Conducted pre-storm inspection of DIIs. Some trash and organic debris were removed from the Fossil Filter DII. Approximately 20 inches of ponded water was observed in the StreamGuard DII but no maintenance was required.
- 2/27/00: Some debris accumulated in the Fossil Filter DII partially blocking the filter cartridge but did not cause flow bypass. DII was subsequently cleaned once during the storm event in accordance with the MID. No bypass occurred and no maintenance was required of the StreamGuard DII.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

I-605/SR-91 Interchange Bio Strip & Swale (Site ID 73222 a, b) MW/Law

Monitoring/Sampling Activities

Strip:

- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.52 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/11/00: H-flumes were cleaned of trash and debris.
- 1/16/00: Samplers were programmed for forecasted storm and flumes were cleaned. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm.
- 1/25/00: Storm produced 0.55 inch of rainfall. Composite sample was collected at the influent but not the effluent (flow did not reach effluent monitoring location allowing for a paired sample), therefore, influent sample was not sent to the laboratory for analysis. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration strip.
- 1/30/00: A vehicle drove off the I-605/SR-91 westbound connector and crashed into the effluent monitoring station. The enclosure and monitoring equipment were torn from the concrete pad. The concrete pad was also pushed approximately 6 inches and the tubing stub-out was damaged. The vehicle did not drive into the strip.
- 1/31/00: Monitoring equipment was taken back to the office for diagnostic checks.
- 2/3/00: Diagnostic checks were run on monitoring equipment. Sampler was operational but the flow meter was damaged. Consequently, the flow meter was sent to American Sigma for repair. Began reinstalling monitoring station; 80% complete.
- 2/7/00: Arrived at the site to complete the monitoring station installation but found that another accident occurred at the site between 2/3/00 p.m. and 2/7/00 a.m. This time the vehicle barely missed the recently installed monitoring station and drove across the strip. Tire tracks were observed in the biofiltration strip but no maintenance was required as none of the MID thresholds were met. The monitoring station installation was completed.

- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.26 inch of rainfall. A team was not mobilized because the deployment criteria were not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.14 inches of rainfall in a 2 to 3 hour period. The minimum antecedent dry period was not met. However, a team was mobilized to make hydraulic residence time measurements at the Cerritos Maintenance Station swale and was able to make empirical observations of the strip.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.62 inch of rainfall. Teams were not mobilized because the 48-hour antecedent dry period was not met.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.14 inches of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because the percent storm capture was not attained, composite samples were not sent to the laboratory for analysis. Grab samples were successfully collected and sent to the laboratory for analysis. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 0.98 inch of rainfall. No teams were mobilized because the 48-hour antecedent dry period was not met.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.16 inch of rainfall. Teams were mobilized and a composite samples was collected at the influent (control) and location. No flow passed through the strip to allow collection of an effluent sample. No paired samples were obtained.

Monitoring Summary – Biofiltration Strip, 605/91

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.09	N	N	NA	NA	N
12/31/99	0.52	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	N	N	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.26	N	N	NA	NA	N
2/12-14/00	1.14	N	Y*	NA	NA	Y
2/16/00	0.62	N	N	NA	NA	N
2/20-21/00	2.14	Y	Y	N	Y	Y
2/23/00	0.98	N	N	NA	NA	N
2/27/00	0.16	Y	Y	N	N	Y

*A team was mobilized to the Cerritos Maintenance Station swale to conduct hydraulic residence time measurements. Empirical observations of the strip were made while the team was in the area.

Swale:

- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.52 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/11/00: H-flumes were cleaned of trash and debris.
- 1/16/00: Samplers were programmed for forecasted storm and flumes were cleaned. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm.
- 1/25/00: Storm produced 0.55 inch of rainfall. Composite sample was collected at the influent but not the effluent (flow did not reach effluent monitoring location allowing for a paired sample), therefore, influent sample was not sent to the laboratory for analysis. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams

were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration swale.

- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.26 inch of rainfall. No teams were mobilized because the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.14 inches of rainfall in a 2 to 3 hour period. The minimum antecedent dry period was not met. However, a team was mobilized to make hydraulic residence time measurements at the Cerritos Maintenance Station swale and was able to make empirical observations of the swale.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.62 inch of rainfall. Teams were not mobilized because the 48-hour antecedent dry period was not met.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.14 inches of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because there was very little flow through the effluent, the minimum number of aliquots and sample volume was not attained resulting in composite samples not being sent to the laboratory for analysis. Grab samples were successfully collected and sent to the laboratory for analysis. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 0.98 inch of rainfall. No teams were mobilized because the 48-hour antecedent dry period was not met.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.16 inch of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because only the influent station collected a sample that met the percent storm capture, minimum number of aliquots, and needed sample volume, only the influent sample was sent to the laboratory for analysis. No paired samples were obtained.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.09	N	N	NA	NA	N
12/31/99	0.52	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	N	N	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.26	N	N	NA	NA	N
2/12-14/00	1.14	N	Y*	NA	NA	Y
2/16/00	0.62	N	N	NA	NA	N
2/20-21/00	2.14	Y	Y	N	Y	Y
2/23/00	0.98	N	N	NA	NA	N
2/27/00	0.16	Y	Y	N	N	Y

*A team was mobilized to the Cerritos Maintenance Station swale to conduct hydraulic residence time measurements. Empirical observations of the swale were made while the team was in the area.

Operations and Maintenance

Strip:

12/3/99: Scarified backside of strip in preparation of hydroseed.

12/10/99: Area on backside of strip was hydroseeded.

12/20/99: Watered strip in accordance with Margot Griswold's recommended schedule. However, the soil did not get wet due to Santa Ana wind conditions.

12/21/99: Re-watered strip due to lack of soil moisture achieved on 12/20/99.

1/6/00: Conducted monthly/post-storm inspection. Based on observations, flow passed through the entire strip. No channelization or ponding observed within strip. Gopher holes were observed at the site and mitigation will continue. Hydroseed has begun to sprout in some areas. Over half of the transplanted salt grass appears brown (roots may not have reached the moisture zone).

1/11/00: Trash and debris were removed from the collector ditch and gopher holes were flattened. Salt grass and hydroseed was inspected by Margot Griswold.

- 1/14/00: Two gopher traps set.
- 1/18/00: No gophers caught from traps set on 1/14/00. Old burrows filled in with soil and one trap set in fresh burrow.
- 1/25/00: Flow was not perceptible through the biofilter and no flow was recorded by the monitoring equipment. No channelization or ponding was observed within the strip.
- 1/28/00: Gopher traps set in fresh burrows and old burrows filled in with soil.
- 2/7/00: Arrived at the site and found that another accident occurred at the site between 2/3/00 p.m. and 2/7/00 a.m. The vehicle drove across the strip leaving tire tracks. No maintenance was required as none of the MID thresholds were met.
- 2/9/00: Conducted monthly site inspections and removed trash. The coverage of the transplanted area has reduced to approximately 50 percent. Coverage of the main salt grass area is approximately 100 percent. Coverage of hydroseeded area outside of the strip is approximately 10 percent.
- 2/10/00: Weeds that were greater than 12 inches were pulled and trash and debris were removed.
- 2/11/00: Gopher inspection and abatement conducted.
- 2/12/00: Flow was perceptible as it passed through the strip. Trash and debris accumulated at the asphalt/strip interface. No channelization or ponding was observed within the strip.
- 2/20/00: Flow was perceptible as it passed through the strip. Trash and debris accumulated at the asphalt/strip interface. No channelization or ponding was observed within the strip.
- 2/27/00: Flow was not perceptible through the biofilter and no flow was recorded by the monitoring equipment. No channelization or ponding was observed within the strip. A vehicle drove off the I-605/SR-91 westbound connector into the strip. Tire tracks were observed in the vegetation. No maintenance is required.

Swale:

- 12/3/99: Scarified swale slopes in preparation of hydroseed.
- 12/10/99: Swale slopes were hydroseeded.
- 12/20/99: Watered swale in accordance with Margot Griswold's recommended schedule.
- 1/6/00: Conducted monthly/post-storm inspection. Based on observations, flow passed through the entire swale. No channelization or ponding observed within swale. Trash and debris collected within the energy dissipater; this was removed on 1/11/2000. Gopher holes were observed at the site and mitigation will continue. Hydroseed has begun to sprout in some areas.
- 1/11/00: Trash and debris were removed from the energy dissipater and the concrete spreader/biofilter interface and gopher holes were flattened. Salt grass and hydroseed was inspected by Margot Griswold.

- 1/14/00: Two gopher traps set.
- 1/18/00: No gophers caught from traps set on 1/14/00. Old burrows filled in with soil and two traps set in fresh burrows.
- 1/25/00: Flow passed through 3/4 of the swale. No channelization or ponding was observed within the swale.
- 1/28/00: Gopher traps set in fresh burrows and old burrows filled in with soil.
- 2/9/00: Conducted monthly site inspections and removed some trash from the concrete spreader/biofilter interface. Erosion of the freeway embankment near the outfall headwall caused soil to fall into the energy dissipater. Coverage of the salt grass is approximately 95 percent and the coverage of the swale slopes is approximately 40 percent.
- 2/10/00: Weeds that were greater than 12 inches were removed and soil in the energy dissipater was removed.
- 2/11/00: Gopher inspection and abatement conducted.
- 2/12/00: Flow was perceptible as it passed through the swale. Trash and debris accumulated in the energy dissipater and at the concrete spreader/biofilter interface. No channelization or ponding was observed within the swale. Hydraulic residence time measurements could not be conducted because flow stopped before the test could be completed.
- 2/20/00: Flow was perceptible as it passed through the swale. Most of the flow infiltrated into the soil before it reached the effluent monitoring location. Runoff in the downstream earthen/vegetative channel began to back up towards the swale. Subsequently, the downstream channel was enlarged so that flow would pass freely and no cause a surcharge condition. Trash and debris accumulated in the energy dissipater and at the concrete spreader/biofilter interface. No channelization or ponding was observed within the swale.
- 2/27/00: Flow was perceptible as it passed through the swale. Most of the flow infiltrated into the soil before it reached the effluent monitoring location. Trash and debris accumulated in the energy dissipater and at the concrete spreader/biofilter interface. No channelization or ponding was observed within the swale.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

Cerritos Maintenance Station Bio Swale (Site ID 73223) MW/Law

Monitoring/Sampling Activities

- 12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.
- 12/9/99: Samplers were programmed for forecasted storm and flumes were cleaned.
- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.52 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/3/00: Influent monitoring station was vandalized before 12/31/99 storm event. Someone snapped the connection from the bubbler tube to the H-flume. Consequently, no flow measurements were recorded. Bubbler tube connection was repaired.
- 1/12/00: H-flumes were cleaned of trash and debris.
- 1/16/00: Samplers were programmed for forecasted storm and flumes were cleaned. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm.
- 1/25/00: Storm produced 0.55 inch of rainfall. Composite sample was collected at the influent but not the effluent (flow did not reach effluent monitoring location allowing for a paired sample), therefore, influent sample was not sent to the laboratory for analysis. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration swale.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.26 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.14 inches of rainfall in a 2 to 3 hour period. A team was mobilized to make hydraulic residence time measurements of the swale.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.62 inch of rainfall. Teams were not mobilized because the 48-hour antecedent dry period was not met.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.14 inches of rainfall. Teams were mobilized and composite and grab samples were collected at both influent and effluent locations. Influent and effluent samples met minimum percent storm capture and

minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 0.98 inch of rainfall. No teams were mobilized because the 48-hour antecedent dry period was not met.

2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.16 inch of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because only the influent station did not collect the minimum number of aliquots required, samples were sent to the laboratory and results will be used for Caltrans' highway characterization. Grab samples were successfully collected at both influent and effluent locations and sent to the laboratory for analysis. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.09	N	N	NA	NA	N
12/31/99	0.52	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	N	N	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.26	N	N	NA	NA	N
2/12-14/00	1.14	N*	Y**	NA	NA	Y
2/16/00	0.62	N	N	NA	NA	N
2/20-21/00	2.14	Y	Y	Y	Y	Y
2/23/00	0.98	N	N	NA	NA	N
2/27/00	0.16	Y	Y	N	Y	Y

*Criteria were not met for sampling.

**Hydraulic residence time measurements were taken.

Operations and Maintenance

- 12/3/99: Scarified swale slopes in preparation of hydroseed.
- 12/10/99: Swale slopes were hydroseeded.
- 12/20/99: Watered swale in accordance with Margot Griswold's recommended schedule.
- 1/6/00: Conducted monthly/post-storm inspection. Based on observations, flow passed through the entire swale. A minor amount of saltgrass was removed at the interface of the swale and the energy dissipater.. Trash and debris accumulated at the concrete spreader/biofilter interface and within the energy dissipater; this was removed on 1/12/00. Gopher holes were observed at the site and mitigation will continue. Hydroseed has begun to sprout in some areas.
- 1/11/00: Root structure of salt grass was evaluated by Margot Griswold.
- 1/12/00: Trash and debris were removed from the energy dissipater and the concrete spreader/biofilter interface and gopher holes were flattened.
- 1/14/00: Two gopher traps set.
- 1/18/00: One gopher caught from traps set on 1/14/00. Old burrows filled in with soil and four traps set in fresh burrows. Old burrows filled in with soil and one more gopher caught.
- 1/25/00: Flow passed through 2/3 of the swale. As flow progressed through the swale, it infiltrated through previously filled-in gopher holes causing the runoff to flow into the subsurface gopher hole laterals. Flow eventually eroded areas of the side slope where gopher holes had been previously filled in and where new gopher holes had been burrowed during the storm event, resulting in damage to the swale and flow bypass. As a temporary measure to promote flow to pass through the entire length of the swale, onsite soil and sandbags were used to repair the eroded areas.
- 1/28/00: Gopher traps to be set in fresh burrows and old burrows filled in with soil.
- 2/2/00: Backfilled 14 gopher holes with clay material leaving room for a 3-inch layer of topsoil. Stabilized east side slope.
- 2/9/00: Conducted monthly site inspections. Repaired small cracks on the east slope and removed trash at the concrete spreader/biofilter interface. Coverage of the salt grass reduced to approximately 85 percent because of gopher activity. Coverage of the slopes is approximately 30 percent. In accordance with the MID, barren areas of the swale invert will be transplanted with salt grass in October/November.
- 2/10/00: Weeds that were greater than 12 inches were pulled and trash and debris were removed.
- 2/11/00: Gopher inspection and abatement conducted.
- 2/12/00: As flow progressed through the swale, it infiltrated through previously filled-in gopher holes at the downstream end of the swale causing the runoff to flow into the subsurface gopher hole laterals. Flow eventually eroded areas of the side slope

where gopher holes had been previously filled in and where new gopher holes had been burrowed during the storm event, resulting in damage to the swale and flow bypass. As a temporary measure to promote flow to pass through the entire length of the swale, clay and sandbags were used to plug the gopher holes. Once the gopher holes were plugged and flow was established through the entire length of the swale, hydraulic residence time measurements were conducted. The hydraulic residence time was estimated to be approximately 5 minutes (calculated from the time dye first entered the swale to the time it reached the end of the swale). Sediment, trash and debris accumulated in the energy dissipater and within the first third of the swale.

- 2/17/00: Trash and debris that had collected in the energy dissipater and first third of the swale were removed.
- 2/20/00: As flow progressed through the swale, it infiltrated through previously filled-in gopher holes at the downstream end of the swale causing the runoff to flow into the subsurface gopher hole laterals. Flow eventually eroded areas of the side slope where gopher holes had been previously filled in and where new gopher holes had been burrowed during the storm event, resulting in damage to the swale and flow bypass. As a temporary measure to promote flow to pass through the entire length of the swale, clay was used to plug the gopher holes. Sediment, trash and debris accumulated in the energy dissipater and within the first third of the swale.
- 2/27/00: As flow progressed through the swale, it infiltrated through previously filled-in gopher holes at the downstream end of the swale causing the runoff to flow into the subsurface gopher hole laterals. Flow eventually eroded areas of the side slope where gopher holes had been previously filled in and where new gopher holes had been burrowed during the storm event, resulting in damage to the swale and flow bypass. As a temporary measure to promote flow to pass through the entire length of the swale, clay was used to plug the gopher holes. Sediment, trash and debris accumulated in the energy dissipater and within the first third of the swale.

Vector Activities

None noted during routine inspection.

Issues / Solutions

Erosion occurred at the concrete spreader/biofilter interface and the first 6-8 feet of the salt grass was flattened and some areas of salt grass was washed away. Margot Griswold evaluated the root structure of the salt grass on 1/11/00. Results of her inspection were documented in a memo.

Despite efforts to abate gophers and backfill their burrows with clay, flow bypass occurs during storm events and the structural integrity of the swale continues to become compromised.

I-5/I-605 Bio Swale (Site ID 73224) MW/Law

Monitoring/Sampling Activities

- 12/3/99 through 3/3/00: Data was downloaded from the monitoring equipment.
- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.22 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/10/00: H-flumes were cleaned of trash and debris.
- 1/16/00: Samplers were programmed for forecasted storm and flumes were cleaned. Battery was changed out at the effluent monitoring location. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm.
- 1/25/00: Storm produced 0.55 inch of rainfall. Composite sample was collected at the influent but not the effluent (flow did not reach effluent monitoring location allowing for a paired sample), therefore, influent sample was not sent to the laboratory for analysis. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.30 inch of rainfall. No teams were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration swale.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.45 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.01 inch of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.58 inch of rainfall. Teams were not mobilized because the 48-hour antecedent dry period was not met.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.29 inches of rainfall. Teams were mobilized and composite and grab samples were collected at both influent and effluent locations. Influent and effluent samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 1.23 inches of rainfall. No teams were mobilized because the 48-hour antecedent dry period was not met.

2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.21 inch of rainfall. Teams were mobilized and composite and grab samples were collected at both influent and effluent locations. Influent and effluent samples met minimum percent storm capture and minimum number of aliquots, and enough volume was collected to run the entire analytical suite. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.16	N	N	NA	NA	N
12/31/99	0.22	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	N	N	Y
1/30-31/00	0.30	N	N	NA	NA	N
2/10-11/00	0.45	N	N	NA	NA	N
2/12-14/00	1.01	N	N	NA	NA	N
2/16/00	0.58	N	N	NA	NA	N
2/20-21/00	2.29	Y	Y	Y	Y	Y
2/23/00	1.23	N	N	NA	NA	N
2/27/00	0.21	Y	Y	Y	Y	Y

Operations and Maintenance

12/3/99: Scarified swale slopes in preparation of hydroseed.

12/10/99: Swale slopes were hydroseeded.

1/6/00: Conducted monthly/post-storm inspection. Based on observations, flow passed through the entire swale. No channelization or ponding was observed within swale. Approximately 3/4 inch of ponding water was observed in the energy dissipater. Some ice plant was observed and was removed on 1/10/00. Some areas of hydroseed have begun to sprout. Trash and debris collected within the energy dissipater and at the concrete spreader/biofilter interface; this was removed on 1/10/00. Gopher holes were observed at the site and mitigation will continue.

- 1/10/00: Ice plant was removed from the site, trash and debris were removed from the energy dissipater and the concrete spreader/biofilter interface, and gopher holes were flattened.
- 1/11/00: Salt grass and hydroseed was inspected by Margot Griswold.
- 1/25/00: Flow passed through 1/4 of the swale. No channelization or ponding was observed within the swale.
- 1/28/00: Gopher traps to be set in fresh burrows and old burrows filled in with soil.
- 2/9/00: Conducted monthly site inspections and removed some trash. Coverage of the salt grass is approximately 95 percent and the coverage of the swale slopes is approximately 70 percent.
- 2/10/00: Woody vegetation and weeds that were greater than 12 inches were pulled and trash and debris were removed.
- 2/11/00: Gopher inspection and abatement conducted.
- 2/20/00: Flow passed through entire swale. No channelization or ponding was observed within the swale. Trash and debris accumulated in the energy dissipater at the concrete spreader/biofilter interface.
- 2/27/00: Flow passed through entire swale. No channelization or ponding was observed within the swale. Trash and debris accumulated in the energy dissipater at the concrete spreader/biofilter interface.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

I-605/Carson & Del Amo Bio Swale (Site ID 73225) MW/Law

Monitoring/Sampling Activities

- 12/31/99: Forecast predicted scattered showers to produce < 0.10 inch of rainfall with a 30% probability of occurrence. Storm event produced 0.52 inch of rainfall. No teams were mobilized because the deployment criteria were not met and because Caltrans deemed sampling unsafe during the holidays.
- 1/10/00: H-flumes were cleaned of trash and debris.
- 1/16/00: Samplers were programmed for forecasted storm and flumes were cleaned. Forecasted storm did not produce measurable rain. No crews were mobilized.
- 1/24/00: Samplers were programmed for forecasted storm.

- 1/25/00: Storm produced 0.55 inch of rainfall. Composite sample was collected at the influent but not the effluent (only 2 cubic feet of flow discharged through the effluent monitoring location, which disallowed a paired sample), therefore, influent sample was not sent to the laboratory for analysis. Empirical observations were made.
- 1/30/00: Forecast predicted rain to produce between 0.05 and 0.25 inch of rainfall with a 70% probability of occurrence. Storm event produced 0.25 inch of rainfall. No teams were mobilized because of the unlikelihood of rainfall producing enough runoff to discharge through the biofiltration swale.
- 2/10/00: Forecast predicted rain to produce < 0.10 inch of rainfall with a 40% probability of occurrence. Storm event produced 0.26 inch of rainfall. No teams were mobilized because of the deployment criteria was not met.
- 2/12/00: Forecast predicted rain to produce between 1 and 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 1.14 inches of rainfall. No teams were mobilized because of the antecedent dry period was not met.
- 2/16/00: Forecast predicted rain to produce 0.50 inch of rainfall with a 60% probability of occurrence. Storm event produced 0.62 inch of rainfall. Teams were not mobilized because the 48-hour antecedent dry period was not met.
- 2/20/00: Forecast predicted rain to produce up to 2 inches of rainfall with a 100% probability of occurrence. Storm event produced 2.14 inches of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because there was very little flow through the effluent, the minimum number of aliquots and sample volume was not attained resulting in composite samples not being sent to the laboratory for analysis. Grab samples were successfully collected and sent to the laboratory for analysis. Empirical observations were made. Hydraulic residence time measurements were taken once it was determined that the composite samples were not going to be sent to the laboratory and after the grab samples were collected.
- 2/23/00: Forecast predicted rain to produce between 0.5 and 1.5 inches of rainfall with an 80% probability of occurrence. Storm event produced 0.98 inch of rainfall. No teams were mobilized because the 48-hour antecedent dry period was not met.
- 2/27/00: Forecast predicted rain to produce between 0.25 and 0.50 inch of rainfall with a 90% probability of occurrence. Storm event produced 0.16 inch of rainfall. Teams were mobilized and composite samples were collected at both influent and effluent locations. However, because there was very little flow through the effluent, the minimum number of aliquots and sample volume was not attained resulting in composite samples not being sent to the laboratory for analysis. Empirical observations were made.

Monitoring Summary

Date	Rainfall Total	Antecedent Dry Period & Deployment Criteria Met	Mobilized	Sampled		Empirical Observations
				Comp	Grab	
11/8/99	0.09	N	N	NA	NA	N
12/31/99	0.52	N	N	NA	NA	N
1/16/00	0.00	N	N	NA	NA	N
1/25/00	0.55	Y	Y	N	N	Y
1/30-31/00	0.25	N	N	NA	NA	N
2/10-11/00	0.26	N	N	NA	NA	N
2/12-14/00	1.14	N	N	NA	NA	N
2/16/00	0.62	N	N	NA	NA	N
2/20-21/00	2.14	Y	Y*	N	Y	Y
2/23/00	0.98	N	N	NA	NA	N
2/27/00	0.16	Y	Y	N	N	Y

* Hydraulic residence time measurements were taken.

Operations and Maintenance

- 12/3/99: Scarified swale slopes in preparation of hydroseed.
- 12/10/99: Swale slopes were hydroseeded.
- 12/13/99: Watered swale in accordance with Margot Griswold's recommended schedule.
- 12/23/99: Caltrans sprinkler system was observed to be back online but was leaking and creating a pool of water between the swale and the guard rail. The pool of water caused the hydroseed in the area to begin to sprout. Caltrans was notified.
- 1/6/00: Conducted monthly/post-storm inspection. Based on observations, flow passed through the entire swale. No channelization or ponding was observed within swale. Caltrans irrigation system is still leaking and created a pool of water between the swale and the guard rail and within the swale; Caltrans was notified. Hydroseed has begun to grow in the area of ponding. Trash and debris collected within the energy dissipater; this was removed on 1/10/00. Some weeds were taller than 12 inches and were removed on 1/10/00.
- 1/10/00: Weeds taller than 12 inches were pulled and trash and debris were removed from the energy dissipater.

- 1/11/00: Salt grass and hydroseed was inspected by Margot Griswold.
- 1/25/00: Flow passed through the entire swale but only 2 cubic feet of flow discharged passed the effluent monitoring location. No channelization or ponding was observed within the swale.
- 2/9/00: Conducted monthly site inspections and removed trash. Coverage of the salt grass is approximately 98 percent and the coverage of the swale slopes is approximately 15 percent.
- 2/10/00: Weeds that were greater than 12 inches were removed and organic material that collected in the first quarter of the swale was removed.
- 2/18/00: Organic material that collected in the first quarter of the swale was removed.
- 2/20/00: Flow was perceptible as it passed through the swale. Trash and debris accumulated in the energy dissipater and at the concrete spreader/biofilter interface. No channelization or ponding was observed within the swale. The hydraulic residence time was estimated to be approximately 31 minutes (calculated from the time dye first entered the swale to the time it reached the end of the swale).
- 2/27/00: Flow was perceptible as it passed through the swale. Trash and debris accumulated in the energy dissipater and at the concrete spreader/biofilter interface. No channelization or ponding was observed within the swale.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

District 11 BMP Pilot Sites

Monitoring Activities Applicable to All Sites

No storms were monitored during December. Two storms passed through the area, but the Weather Bureau forecasts for both storms did not meet the criteria established by Caltrans for monitoring and both were showery in nature. Some rain gauges in the county recorded zero inches of rainfall and others recorded significant rainfall. One storm occurred on December 10. This storm was most heavily focused on the San Dieguito River Valley from Del Mar to Escondido. The weather bureau rain gauge in Escondido recorded 0.3-inches of rain. This was the heaviest in the county.

A second storm occurred on the evening of December 31 and the early morning of January 1. This was during the period defined by Caltrans as a no monitoring period during the New Year's day weekend. A second wave moved through during the early morning hours of January 2. These two waves were also showery and spotty in coverage. The heaviest rainfall occurred in extreme southern San Diego County and again in the Escondido area. For the three day period the Escondido Maintenance Station had 0.38-inches of rain and the I-15/SR-78 EDB had 0.36-inches. Rainfall at the other BMP sites was less than 0.20-inches with most being below 0.1-inches.

On the morning of January 25, exactly one year to date from the first monitored event of a BMP in 1999, the National Weather Service predicted a 70% chance of measurable rainfall in San Diego. The Quantitative Precipitation Forecast predicted 0.6" in North County San Diego and 0.5" in San Diego. Caltrans was notified and a full mobilization occurred. This storm was successfully monitored and a complete storm summary is provided in Tables 1 and 2.

In the early morning hours of February 16, a storm event that was predicted by the National Weather Service to have a 50% chance of dropping up to 0.2 inches of rainfall hit the San Diego coast. Field crews were mobilized at 05:30 AM PST and the storm was successfully monitored. A complete storm summary is provided in Tables 1 and 2.

Again in the early morning hours of February 20, a storm event that was predicted by the National Weather Service to have a 70% chance of dropping up to 1.0 inch of rainfall hit San Diego. Field crews were mobilized at 05:00 AM PST and the storm was successfully monitored. A complete storm summary is provided in Tables 1 and 2.

Maintenance Activities Applicable to all sites

Monthly site inspections were completed at all sites on January 3, after the January 25 event, and after the February 16 and 20 events. Weekly site inspections were started during this extended period of wet weather and site inspections were performed during the week of February 28. Minor trash pick-up occurred during all these inspections.

Table 1. Draft Flow Data for Each Monitored Event

Site/Event	Start Flow		End Flow		Duration Flow (hr:min)	Total Flow (ft³)	Volume to Sample	Sample Aliquots Collected	Peak Flow (cfs)	% Capture	Peak Capture	Detention Time (hr)
	Date	Time	Date	Time								
EVENT 1												
SR-78/I15-In	1/25/00	11:37	1/26/00	9:40	22:03:00	2159	0.04	52	0.171	100	Y	24.58
SR-78—Eff	1/25/00	12:47	1/26/00	12:12	23:25:00	371.4	0.03	12	0.036	100	Y	
SR-56/I-5-In	1/25/00	11:40	1/26/00	2:10	14:30:00	912.1	0.08	11	0.193	100	Y	18.00
SR-56/I-5-Eff	1/25/00	22:38	1/26/00	5:40	7:02:00	362.2	0.08	4	0.024	100	Y	
Escondido MS-In	1/25/00	1:19	1/26/00	10:25	33:06:00	1020	0.02	49	0.094	98.1	Y	36.35
Escondido MS-Eff	1/25/00	15:27	1/26/00	13:40	22:13:00	854.5	0.02	42	0.061	100	Y	
SR-78/I-5 P&R-In	1/25/00	9:39	1/25/00	13:20	3:41:00	394.7	0.03	13	0.086	100	Y	19.85
SR-78/I-5 P&R-Eff	1/25/00	11:28	1/26/00	5:30	18:02:00	417.1	0.03	13	0.042	100	Y	
La Costa P&R-In	1/25/00	10:47	1/25/00	15:50	5:03:00	552	0.03	17	0.133	100	Y	26.72
La Costa P&R-Eff	1/25/00	11:00	1/26/00	13:30	26:30:00	>167.9	0.03	5	0.005	100	Y	
Kearny Mesa MS- In	1/25/00	13:42	1/26/00	9:05	19:23:00	603.8	0.08	7	0.146	100	Y	24.62
Kearny Mesa MS-Eff	1/26/00	0:32	1/26/00	14:19	13:47:00	570.9	0.02	25	0.098	100	Y	
La Costa WB-In	1/25/00	11:05	1/26/00	2:00	14:55:00	282.3	0.03	9	0.069	100	Y	23.80
La Costa WB-Eff	1/25/00	11:19	1/26/00	10:53	23:34:00	1811	0.03	43	0.036	100	Y	
Carlsbad MS-IB	1/25/00	10:06	1/26/00	3:00	16:54:00	1145	0.02	38	0.207	100	Y	NA
EVENT 2												
SR-78/I-15-IN	2/16/00	6:24	2/17/00	7:55	25:31:00	3828	0.04	96	0.974	100	Y	28.35
SR-78/I-15-EFF	2/16/00	7:04	2/17/00	10:45	27:41:00	2193	0.03	72	0.091	99.3	Y	
SR-56/I-5-EFF	2/16/00	9:24	2/17/00	3:20	17:56:00	953.5	0.08	13	0.115	100	Y	
Manchester-In	2/16/00	6:08	2/17/00	15:30	33:22:00	1672	0.06	27	1.142	99.6	Y	40.12
Manchester-Eff	2/16/00	11:00	2/17/00	22:15	35:15:00	1174	0.06	19	0.012	100	Y	
Escondido MS-In	2/16/00	6:20	2/17/00	10:32	28:12:00	2134	0.02	106	0.514	98.1	Y	37.25
Escondido MS-Eff	2/16/00	6:58	2/17/00	19:35	36:37:00	1622	0.02	80	0.129	100	Y	
SR-78/I-5 P&R-In	2/16/00	5:49	2/17/00	6:55	25:06:00	274.3	0.03	9	0.048	100	Y	32.52
SR-78/I-5 P&R-Eff	2/16/00	7:08	2/17/00	14:20	31:12:00	258.7	0.03	8	0.016	100	Y	
La Costa P&R-In	2/16/00	6:06	2/17/00	11:01	28:55:00	678	0.03	22	0.241	100	Y	38.23
La Costa P&R-Eff	2/16/00	8:13	2/17/00	20:20	36:07:00	>330	0.03	11	0.008	100	Y	
Kearny Mesa MS-In	2/16/00	6:26	2/17/00	22:15	39:49:00	481.1	0.03	16	0.224	100	Y	40.07
Kearny Mesa MS-Eff	2/16/00	6:38	2/17/00	22:30	39:52:00	370.1	0.03	12	0.28	100	Y	
Lacosta WB-In	2/16/00	6:02	2/17/00	3:10	21:08:00	445	0.03	14	0.549	100	Y	21.75
La Costa WB-Eff	2/16/00	6:05	2/17/00	3:47	21:42:00	765	0.03	25	0.032	93.5	Y	
Carlsbad MS-IB	2/16/00	5:56	2/17/00	22:55	40:59:00	560.1	0.03	18	0.114	100	Y	NA

Table 1. (cont)

Site/Event	Start Flow		End Flow		Duration Flow (hr:min)	Total Flow (ft ³)	Volume to Sample	Sample Aliquots Collected	Peak Flow (cfs)	% Capture	Peak Capture	Detention Time (hr)
	Date	Time	Date	Time								
EVENT 3												
SR-78/I-15-In	2/20/00	5:13	2/22/00	3:05	45:52:00	25102	0.1/0.3	135	1.226	99.6	Y	72.62
SR-78/I-15-Eff	2/20/00	5:29	2/23/00	5:50	72:21:00	28311	.09/.27	156	0.181	100	Y	
SR-56/I-5-In	2/20/00	5:07	2/22/00	8:30	51:23:00	18312	.12/.36	101	1.851	97.3	Y	66.80
SR-56/I-5-Eff	2/20/00	5:21	2/22/00	23:55	66:34:00	21250	0.1/0.3	122	0.265	100	Y	
Manchester-In	2/20/00	4:58	2/22/00	1:10	44:12:00	19243	0.1/0.3	115	1.101	98.4	Y	74.03
Manchester-Eff	2/20/00	5:00	2/23/00	7:00	74:00:00	6593*	0.09	73	0.051	<100	Y	
Escondido MS-In	2/20/00	5:43	2/22/00	10:10	52:27:00	9028	0.06/.18	102	0.72	99.7	Y	52.28
Escondido MS-Eff	2/20/00	6:04	2/22/00	10:00	51:56:00	7048	0.06/.18	92	0.129	100	Y	
SR-78/I-5 P&R-IN	2/20/00	4:38	2/22/00	0:55	44:17:00	4190	0.05	87	1.46	100	Y	57.32
SR-78/I-5 P&R-Eff	2/20/00	5:12	2/22/00	13:57	56:45:00	4981	0.05	99	0.246	100	Y	
La Costa P&R-In	2/20/00	5:04	2/22/00	11:00	53:56:00	7474	0.06/.18	93	0.448	99.9	Y	73.93
La Costa P&R-Eff	2/20/00	5:31	2/23/00	7:00	73:29:00	7374*	0.05/.15	101	0.22	<99.9	Y	
Kearny Mesa MS-In	2/20/00	5:33	2/21/00	22:00	40:27:00	26426	.1/.3	97	2.4	<93.9	N	41.87
Kearny Mesa MS-Eff	2/20/00	5:36	2/21/00	23:25	41:49:00	28306	.1/.3	148	3.18	98.9	Y	
La Costa WB-In	2/20/00	4:55	2/22/00	2:55	46:00:00	9926	.1/.3	85	0.807	100	Y	51.00
Lacosta WB-Eff	2/20/00	5:03	2/22/00	7:55	50:52:00	7520	0.1	78	0.113	100	Y	
Palomar SW-In	2/20/00	4:55	2/20/00	10:05	5:10:00	1289	0.06	24	0.197	100	Y	10.50
Palomar SW-Eff	2/20/00	4:55	2/20/00	15:25	10:30:00	3754	0.05	75	0.485	100	Y	
Carlsbad MS IB	2/20/00	4:42	2/20/00	12:45	8:03:00	2926	0.06	48	0.447	100	Y	6.47
Carlsbad MS ST	2/20/00	4:45	2/20/00	11:10	6:25:00	454.5	0.02	22	0.057	100	Y	

* Flow ended early because of the beginning of another storm system.

NA = not available

Table 2. Draft Rainfall and Runoff Statistics for Each Monitored Event

Site/Event	Start Rain		End Rain		Duration Rain (hours:minutes)	Total Rain (inches)	Max Intensity (Inches/hour)	Antecedent Rain (days)	Antecedent Rain (inches)
	Date	Time	Date	Time					
EVENT 1									
SR-78/I-15	1/25/2000	11:20	01/26/00	4:05	16:45:00	0.3	NA	23.4	0.11
SR-56/I-5	1/25/2000	11:20	01/26/00	1:40	14:20:00	0.17	NA	24.5	0.21
Escondido MS	1/25/2000	11:15	01/26/00	2:45	15:30:00	0.29	NA	23.4	0.13
SR-78/I-5 P&R	1/25/2000	9:30	01/26/00	0:20	14:50:00	0.27	NA	>90	
Lacosta P&R	1/25/2000	10:45	01/26/00	0:55	14:10:00	0.19	NA	24.4	0.10
Kearny Mesa MS	1/25/2000	14:50	01/26/00	1:45	10:55:00	0.08	NA	>90	
LA Costa WB	1/25/2000	11:20	01/26/00	0:30	13:10:00	0.16	NA	24.3	0.11
Carlsbad MS	1/25/2000	10:05	01/26/00	0:45	14:40:00	0.29	NA	45.0	0.10
EVENT 2									
SR-78/I-15	2/16/2000	6:20	2/17/2000	8:00	25:40:00	0.38	NA	3.9	0.55
SR-56/I-5	2/16/2000	6:10	2/16/2000	20:30	14:20:00	0.2	NA	4.1	0.33
Manchester	2/16/2000	6:05	2/17/2000	~2:00	19:55:00	0.22	NA	2.7	0.3
Escondido MS	2/16/2000	6:15	2/17/2000	2:40	20:25:00	0.5	NA	2.9	0.17
SR-78/I-5 P&R	2/16/2000	5:50	2/16/2000	21:40	15:50:00	0.14	NA	2.1	0.12
La Costa P&R	2/16/2000	6:10	2/17/2000	4:20	22:10:00	0.16	NA	4.0	0.27
Kearny Mesa MS	2/16/2000	6:15	2/16/2000	20:55	14:40:00	0.1	NA	3.9	0.4
La Costa WB	2/16/2000	6:05	2/17/2000	4:30	22:25:00	0.16	NA	4.0	0.26
Carlsbad MS	2/16/2000	5:50	2/17/2000	2:05	20:15:00	0.16	NA	4.0	0.3
EVENT 3									
SR-78/I-15	2/20/2000	6:00	2/22/2000	5:20	47:20:00	1.99	NA	2.9	0.38
SR-56/I-5	2/20/2000	5:30	2/21/2000	19:00	37:30:00	1.64	NA	3.4	0.20
Manchester	2/20/2000	5:00	2/22/2000	0:55	43:55:00	1.53	NA	3.1	0.22
Escondido MS	2/20/2000	6:00	2/22/2000	1:35	43:35:00	2.12	NA	3.1	0.50
SR-78/I-5 P&R	2/20/2000	4:40	2/22/2000	3:00	46:20:00	2.16	NA	3.3	0.12
La Costa P&R	2/20/2000	5:05	2/22/2000	2:25	45:20:00	1.45	NA	3.6	0.14
Kearny Mesa Ms	2/20/2000	5:40	2/22/2000	1:05	43:25:00	2.32	NA	3.3	0.1
La Costa WB	2/20/2000	4:55	2/22/2000	7:55	51:00:00	1.45	NA	3.6	0.13
Palomar SW	2/20/2000	4:50	2/20/2000	9:50	5:00:00	0.62	NA	3.6	0.14
Carlsbad MS	2/20/2000	4:45	2/20/2000	7:40	2:55:00	0.58	NA	3.6	0.14

I-5/SR-56 Extended Detention Basin (Site ID 111101) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

Woody wetland vegetation was pulled on January 3 from the first inlet rip-rap.

KLI investigated the proposal of grouting in the rip-rap energy dissipator at the inlet to alleviate standing water. However, the invert of the inlet pipe is below the invert of the entire basin. Therefore, grouting in the rip-rap will still create a concrete depression that will continue to hold water.

The new hydroseed at the I-5/SR-56 EDB is sprouting on the east sidewall of the basin and minor sprouting has occurred on the basin floor.

Vector Activities

December 27, 1999: Second basin breeding mosquitoes; site abated with Altosid pellets.

January 24, 2000: Breeding found in the second basin; site treated with Altosid.

January 31, 2000: Breeding found; no abatement performed.

February 7, 2000: Breeding found; no abatement performed.

February 14: Breeding noted in the second basin; no abatement performed.

Issues / Solutions

None

SR-78/I-15 Extended Detention Basin (Site ID 111102) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

No maintenance activities to note for this entire time period.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

I-5/La Costa Avenue Infiltration Basin (Site ID 111103) KLI

Monitoring/Sampling Activities

The La Costa Infiltration Basin was instrumented with monitoring equipment on January 12. Baseline well samples were taken on January 19. Attempts to recover baseline sediment samples using the OMM procedure and a Geo-probe Macro Corer on January 17 failed because of a layer of coarse aggregate. An alternative method using a powered vibracore was used to get these samples on February 8, 2000. Four sampling points were chosen from a research randomizer and sampled within the basin invert. Three layers, a surface layer (0-0.98 ft), a mid-layer (0.98- 1.64ft), and a bottom layer (1.97-2.62 ft), were composited from each core and sent to the laboratory for analysis.

Required water level data from the January 25, February 16 and February 20 storm events were obtained at the La Costa Infiltration Basin.

Groundwater well samples were taken at the La Costa Infiltration Basin on February 29.

Operations and Maintenance

Woody wetland vegetation was pulled from the basin on February 4.

Vector Activities

None noted during routine inspection.

Issues / Solutions

The infiltration basin is currently at full capacity after three successive storms in February and has a stage of 2.9 ft.

I-5/La Costa Wet Basin (Site ID 111104) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Baseline monthly 48-hour time weighted composite samples were collected in December, January and February from the trapezoidal channel adjacent to the La Costa Wet Basin and submitted for chemical analysis. Analytical results for September, October, November and December are provided in this report.

Operations and Maintenance

The La Costa Wet Basin was weeded during the week of December 27. Generally, the plants have gone dormant for the winter.

The dam that diverts the water to the wet basin in the adjacent trapezoidal channel was blown out during the December 31 storm. It was rebuilt and reinforced and remained in place until the February 20 event when it was blown out again. Maintenance crews rebuilt the dam on February 24.

Vector Activities

January 18, 2000: Breeding noted and sampled at the north end of the basin; no treatment performed.

January 31, 2000: Breeding found; no abatement performed.

February 7, 2000: Breeding found; no abatement performed.

Issues / Solutions

None

I-5/Manchester Avenue Extended Detention Basin (Site ID 111105) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

The seed that was hydroseeded onto the basin floor at the Manchester EDB in November has sprouted due to the accumulation of water that occurred during the past storm events. The seed on the sidewalls of the basin has had minor sprouting.

Vector Activities

None noted during routine inspection.

Issues/Solutions

None

Kearny Mesa Maintenance Station StormFilter - Perlite/Zeolite (Site ID 112201) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

The “seasoning” of the media vaults #2 and #3 occurred on January 11 while the manufacturer, Stormwater Management, observed. Each vault was filled 3 times with potable water from the Maintenance Station supply and was allowed to completely drain each time.

Operations and Maintenance

No maintenance activities to note during this entire time period.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

Escondido Maintenance Station Media Filter - Sand (Site ID 112202) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

No maintenance activities to note during this entire time period.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

La Costa Park and Ride Media Filter - Sand (Site ID 112203) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

The weep holes in the drainpipes were cleared of debris to allow the pre-sedimentation chamber to completely drain its standing water from the December 31, January 25, February 12, 16 and 20 storm events.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

SR-78/I-5 Park and Ride Media Filter - Sand (Site ID 112204) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

The inlet pipe was cleared of sediment debris following the February 12 storm event.

Vector Activities

None noted during routine inspection.

Issues / Solutions

None

Melrose Ave/SR-78 Bio Swale (Site ID 112205) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Operations and Maintenance

Maintenance crews collapsed gopher holes at Melrose on February 9.

Vector Activities

None noted during routine inspection.

Issues / Solutions

During the February 12 event that was not monitored, field crews were mobilized for hydraulic residence time. Upon arrival at the site, crews found most of the swale submerged in at least 2 inches of water. The cause of the swale being submerged was back flow from the effluent due to the two pipes downstream of the swale. The effluent flume was submerged in 4 inches of water. The site was photographed and no hydraulic residence time was calculated. Upon further inspection on February 15 when the site was dry, it was determined that the pipe leading into the creek downstream of the swale at the effluent is completely full of sediment. The plug is in the pipe under the adjacent street and is outside the BMP boundaries. Caltrans was notified of the situation on February 12.

I-5 Palomar Airport Biofiltration Swale (Site ID 112206) KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Hydraulic residence time for the Palomar bio-swale was performed during the February 23 non-monitored event.

Operation and Maintenance

Palomar bio-swale was weeded and cut to a nominal height of 9" per the MID on January 8. Maintenance crews collapsed gopher holes at Palomar on February 9.

Vector Activities

None noted during routine inspection.

Issues / Solutions

Flow has been observed to bypass the swale at the inlet transition from the spreader into the swale. Flow bypasses the swale by leaving through a low spot on the western edge and flowing onto the frontage road, Avenida Encinas. After the February 20 event, field crews placed 8 sandbags and are ready to place an additional 20 should they be required.

Carlsbad Maintenance Station Bio Strip Infiltration Trench (Site ID 112207)

KLI

Monitoring/Sampling Activities

Please refer to Tables 1 and 2 for a complete storm summary of the three monitored events with flow and rainfall data for each BMP site.

Groundwater well samples from the Carlsbad Maintenance Station were taken on February 24.

Field crews attempted to retrieve vadose zone samples on January 27 and February 25, but were unsuccessful.

Operations and Maintenance

Strip:

The site was weeded on January 8.

Trench:

No maintenance activities to note during this entire time period.

Vector Activities

None noted during routine inspection.

Issues / Solutions

After three successive rain events in February, the trench is now full and the monitoring well is reading 10.58 ft. The trench was observed to bypass through the overflow weir during the February 20 event at 9:30 AM PST.

ESTIMATED BMP OPERATION SCHEDULE FOR REMAINING SITES UNDER CONSTRUCTION

Location	BMP Type	Monitor Consultant	Estimated Date Site "On-line" ²	Begin Instrument Install ¹	Complete Instrument Install	Operational ³ (start empirical and maintain)	Ready for Water Quality Monitoring ⁴
DISTRICT 7							
I-210 East of Orcas	CDS	MW/Law	4/13/00	4/13/00	4/27/00	4/27/00	4/27/00
I-210 East of Filmore	CDS	MW/Law	4/13/00	4/13/00	4/27/00	4/27/00	4/27/00
Paxton Park & Ride	MF	BC	11/10/00	11/10/00	11/24/00	11/24/00	11/24/00
Metro MS	MCTT	BC	11/10/00	11/10/00	11/24/00	11/24/00	11/24/00

¹ Equipment installation schedule is dependent upon construction schedule.

² Site on-line means BMP will receive stormwater runoff, not necessarily ready for monitoring or operations.

³ Site operational means BMP meets completion criteria and BMP is turned over to monitoring/maintenance teams to begin empirical observations and maintenance.

⁴ Ready for water quality monitoring means BMP has a full equipment installation and the equipment is ready to draw samples.

SUMMARY OF REQUIRED AND SUCCESSFULLY SAMPLED STORMS PER SITE

Location	BMP Type	Monitoring Consultant	Operational(yes/no)	Operational Date	Maximum Storms Required	1998-1999 Successfully Sampled Storms ¹	1999-2000 Successfully Sampled Storms ²
District 7							
I-605/SR-91	IB	MW/Law	Yes	4/9/99	4	N/A ⁵	N/A ⁵
I-210 East of Orcas	CDS	MW/Law		4/14/00 ²	8	0	
I-210 East of Filmore	CDS	MW/Law		4/14/00 ²	8	0	
I-5/I-605	EDB	BC	Yes	2/26/99	10	2	2
I-605/SR-91	EDB	BC	Yes	2/22/99	10	3	2
Paxton Park & Ride	MF	BC		11/24/00 ²	8	0	
Metro MS	MCTT	BC		11/24/00 ²	8	0	
Alameda MS	OWS	BC	Yes	5/17/99	8	0	2
Eastern MS	MF	BC	Yes	2/15/99	8	1	2
Foothill MS	MF	BC	Yes	3/8/99	8	2	2
Termination Park & Ride	MF	BC	Yes	5/17/99	8	0	2
Via Verde Park & Ride	MCTT	BC	Yes	5/17/99	8	0	2
Lakewood Park & Ride	MCTT	BC	Yes	5/17/99	8	0	2
Altadena	Bio Strip	MW/Law	Yes	10/1/99	8	0	4 ^{3,4}
	Infiltration Trench	MW/Law	Yes	10/1/99	8	N/A ⁵	N/A ⁵
Foothill MS	DII north- StreamGuard Insert	MW/Law	Yes	1/22/99	8	4	5
	DII south- Fossil Filter Insert	MW/Law	Yes	1/22/99	8	3	5 ³
LasFlores MS	DII north-StreamGuard Insert	MW/Law	Yes	1/22/99	8	5	4
	DII south-Fossil Filter Insert	MW/Law	Yes	1/22/99	8	2	4 ³
Rosemead MS	DII north-Fossil Filter Insert	MW/Law	Yes	1/22/99	8	3	4 ³
	DII south-StreamGuard Insert	MW/Law	Yes	1/22/99	8	3	4
I-605/SR-91	Bio Strip	MW/Law	Yes	1/22/99	8	0	
	Bio Swale	MW/Law	Yes	10/1/99	8	0	
Cerritos MS	BioSwale	MW/Law	Yes	10/1/99	8	0	1
I-5/I-605	BioSwale	MW/Law	Yes	10/1/99	8	0	2
I-605/ Del Amo	BioSwale	MW/Law	Yes	10/1/99	8	0	
District 11							
I-5/SR-56	EDB	KLI	Yes	1/24/99	4	5	3 ³
I-15/SR-78	EDB	KLI	Yes	1/24/99	10	4	3 ³
I-5/La Costa (West)	IB	KLI	Yes	1/24/99	4	N/A ⁵	N/A ⁵
I-5/La Costa (East)	WB	KLI	Yes	10/1/99	4	0	3 ³
I-5/Manchester (East)	EDB	KLI	Yes	10/1/99	4	0	2
Kearney Mesa MS	StormFilter (Perlite/Zeolite)	KLI	Yes	10/1/99	8	3	3 ³
Escondido MS	MF	KLI	Yes	2/16/99	8	3	3
La Costa Park & Ride	MF	KLI	Yes	2/16/99	4	3	3 ³
SR-78/I-5 Park & Ride	MF	KLI	Yes	2/26/99	8	2	3
Melrose Ave/SR-78	Bio Swale	KLI	Yes	3/1/99	8	0	
I-5 Palomar Airport Road	Bio Swale	KLI	Yes	10/1/99	8	0	1
Carlsbad MS	Bio Strip	KLI	Yes	10/1/99	4	0	1
	Infiltration Trench	KLI	Yes	10/1/99	4	N/A ⁵	N/A ⁵

1. All DII data in question. A criteria for acceptance has been established. Data will be reviewed at the end of the year.
2. Subject to Schedule Update
3. OMM Manual goal of 12 aliquot minimum sample not attained (First event of 1999-2000)
4. Less than 12 aliquots collected at the influent (First event of 1999-2000)
5. N/A – Groundwater or Vadose Zone Samples

OMM PLAN ACTIVITIES

Volumes I and II

The documents have been finalized and adopted. No changes were made to the documents during the past quarter.

Maintenance Indicator Document

Minor revisions were made to sections for several BMPs. Changes were made to conform to the requests at the Quarterly 7 Meeting. Additional updates were made to the all BMPS which have potential for burrowing rodent problems. The MID was changed to reflect the current repair practice. The Wet Basin maintenance was updated to clarify the plant management. We are preparing supplemental information for the element of the Wet Basin MID regarding vegetation inspection and removal. This information will be handed out at the Quarterly meeting. A revised MID (Version 13a) is included as Appendix I of this document.

Database

The OMM Database is updated every 15th of the month and posted on the www.rbf.com/caltrans web site. Changes made to the database during this quarter include the following: (1) modifications to the electronic forms to reflect changes on the revised field forms in the final adopted OMM Plan, (2) added a feature to the database as well as the website to allow the user to read site-specific reports (in addition to the currently available sorting by BMP type or by District). The site-by site reporting feature will be implemented on the web site mid March 2000. As a result of changes to the database as well as the web site, no updates were made for the month of February. The database will be updated mid March to include data through the month of February 2000.

O&M Cost

O&M costs from the month of November 1999 to January 2000 are included in Appendix D of this document. Summary sheets are provided with costs sorted by BMP types as well as by Districts. The detailed cost breakdown for each BMP site is also included.

VECTOR ACTIVITIES

Summary of vector issues from 12/3/99 to 3/3/00. Site-specific details on vector activities are provided in the OMM section.

DISTRICT 7

San Gabriel Valley Mosquito & Vector Control District

Monitoring

The monitoring efforts of 1/27/00 found breeding occurring in the Media Filter at the MCTT at the Via Verde P&R (Site #74206).

Abatement

1/27/00 - The MCTT at Via Verde P&R (Site #74206) was treated with Golden Bear oil. Prior to this incident, water levels in the sedimentation vault have been maintained below the top ends of the sedimentation tubes and VCD field technicians have monitored this site by removing five to six sedimentation tube “units” at random and sampling the exposed water for mosquito larvae. Using these sampling protocols, this site did not show breeding for several weeks. When water levels became elevated above the sedimentation tubes, numerous mosquito larvae and pupae were exposed. Since pupae were encountered, the field technician felt it necessary to treat the sedimentation vault with Golden Bear oil – the only material available for eliminating pupae.

Greater Los Angeles County Vector Control District

Monitoring

The monitoring effort of 12/10/99 found breeding in the spreader ditch at the Altadena MS (Site #73211a).

The monitoring effort of 12/17/99 found breeding occurring in the MCTT at Lakewood P&R (Site #74208).

The monitoring effort of 1/11/00 found breeding occurring in the MCTT at Lakewood P&R (Site #74208).

The monitoring effort of 2/3/00 found breeding occurring in the MCTT at Lakewood P&R (Site #74208).

The monitoring effort of 2/10/00 found breeding occurring in the MCTT at Lakewood P&R (Site #74208).

The monitoring effort of 2/29/00 found breeding occurring in the MCTT at Lakewood P&R (Site #74208).

Abatement

12/10/99 – The in spreader ditch at the Altadena MS (Site #73211a) was treated with Altosid.

12/17/99 – The MCTT at Lakewood P&R (Site #74208) was treated with Altosid pellets.

1/11/00 – The MCTT at Lakewood P&R (Site #74208) was treated with Altosid pellets.

2/3/00 - The MCTT at Lakewood P&R (Site #74208) was treated with Altosid liquid.

2/10/00 – The MCTT at Lakewood P&R (Site #74208) was treated with Altosid liquid.

2/29/00 - The MCTT at Lakewood P&R (Site #74208) was treated with Altosid liquid.

Los Angeles County West Vector Control District

Monitoring

No sites were found breeding during this period.

Abatement

The LACWVCD applied Altosid pellets to the monitoring vaults of the DIIs at the Las Flores MS (Site #73217) on 12/7/99. There was no vector breeding detected during monitoring. However, there was standing water present in the monitoring vaults/flumes. This water resulted from the consultants normal pre-storm preparations which took place before the LACWVCDs initial monitoring visit on 12/7/99. The district technician treated the monitoring vaults under the mistaken impression that "preventative" pesticide treatments were preferred. The LACWVCD has been notified that abatement should only take place after vector breeding has been verified.

DISTRICT 11

County of San Diego Vector Surveillance and Control

Monitoring

The monitoring effort of 12/27/99 showed breeding in the EDB at I-5/SR-56 (Site #111101).

The monitoring effort of 1/18/00 showed breeding in the Wet Basin (Site#111104).

The monitoring effort of 1/24/00 showed breeding in the EDB at I-5/SR-56 (Site #111101).

The monitoring effort of 1/31/00 showed breeding in the EDB at I-5/SR-56 (Site #111101) and the Wet Basin (Site#111104).

The monitoring effort of 2/7/00 showed breeding in the EDB at I-5/SR-56 (Site #111101) and the Wet Basin (Site#111104).

The monitoring effort of 2/14/00 showed breeding in the EDB at I-5/SR-56 (Site #111101).

Abatement

12/27/99 – The EDB at I-5/SR-56 (Site # 111101) was treated with Altosid pellets.

1/24/00 – The EDB at I-5/SR-56 (Site # 111101) was treated with Altosid pellets.

DEPARTMENT OF HEALTH SERVICES

The Department of Health Services continues to solicit vector production information from other municipalities that operate similar BMPs within their jurisdiction. As of 3/1/00, a total of 77 surveys had been returned (24 from within California and 53 from out-of-state).

DHS continued collecting production data from all BMP sites in Districts 7 and 11. To date, the following efforts have been made in undertaking the mosquito production study:

- Commencing in December, DHS conducted bi-weekly data collection and sampling of BMPs in San Diego (District 11) and Los Angeles (District 7) throughout the period.
- Continued standardization of sampling techniques and monitoring frequency with the Vector Control Districts in District 7 and District 11.

DHS also continues to oversee all aspects of vector monitoring and data collection by the local VCDs. Special efforts have been made to standardize monitoring protocols for the MCTTs which have been shown to be prone to breeding.

On 2/29/00, DHS and representatives from the Greater Los Angeles County Vector Control District, The San Gabriel Valley Mosquito & Vector Control District met with Brown and Caldwell to discuss problems associated with monitoring and abating the MCTTs.

DHS is still seeking internal engineering expertise to formulate specific design recommendations with regard to vector problems associated with the BMPs. These recommendations will be presented to the BMP design team as soon as possible.

DHS continues to fine-tune the vector database. Efforts are being made to link the DHS database to the BMP Pilot Program database operated by RBF. The DHS database should be available for use by the week of 3/6/00.

ADULT MONITORING

UC Riverside continue with the adult mosquito monitoring. Due to the decision to continue monitoring for a second year, a final report will not be prepared until Fall 2000.

The sites monitored by each VCD is summarized in the following table:

Sites Monitored by Vector Control District

Location	BMP Type	Monitor Consultant	Vector Control District	Activities
DISTRICT 7				
I-605/SR-91	IB	MW/Law	GLACVCD	None noted during routine inspection.
I-210 East of Orcas	CDS	MW/Law	GLACVCD	N/A
I-210 East of Filmore	CDS	MW/Law	GLACVCD	N/A
I-5/I-605	EDB	BC	GLACVCD	None noted during routine inspection.
I-605/SR-91	EDB	BC	GLACVCD	None noted during routine inspection.
Paxton Park & Ride	MF	BC	GLACVCD	N/A
Metro MS	MCTT	BC	GLACVCD	N/A
Alameda MS	OWS	BC	GLACVCD	None noted during routine inspection.
Eastern MS	MF	BC	GLACVCD	None noted during routine inspection.
Foothill MS	MF	BC	SGVVCD	None noted during routine inspection.
Termination Park & Ride	MF	BC	GLACVCD	None noted during routine inspection.
Via Verde Park & Ride	MCTT	BC	SGVVCD	January 27, 2000: Breeding found and treated with Golden Bear oil.
Lakewood Park & Ride	MCTT	BC	GLACVCD	December 17, 1999: Breeding noted; site abated with Altosid pellets. January 11, 2000: Breeding noted; site abated with Altosid pellets. February 3, 2000: Breeding noted; site abated with Altosid liquid. February 10, 2000: Breeding noted; site abated with Altosid liquid. February 29, 2000: Breeding noted; site abated with Altosid liquid.
Altadena	Bio Strip/IT	MW/Law	GLACVCD	December 10, 1999: Breeding noted in the spreader ditch; site abated with Altosid.
Foothill	DII	MW/Law	SGVVCD	None noted during routine inspection.
LasFlores	DII	MW/Law	LA Co West	December 7, 1999: Altosid pellets applied to the monitoring vaults of the DIIs. No vector breeding was detected, but standing water was present in the monitoring vaults/flumes due to the consultant's normal pre-storm preparations. The LACWVCD was notified that abatement should only take place after vector breeding has been verified.
Rosemead	DII	MW/Law	SGVVCD	None noted during routine inspection.
I-605/SR-91	Bio Strip/Swale	MW/Law	GLACVCD	None noted during routine inspection.
Cerritos MS	BioSwale	MW/Law	GLACVCD	None noted during routine inspection.
I-5/I-605	BioSwale	MW/Law	GLACVCD	None noted during routine inspection.
I-605/ Del Amo	BioSwale	MW/Law	GLACVCD	None noted during routine inspection.

Sites Monitored by Vector Control District

Location	BMP Type	Monitor Consultant	Vector Control District	Activities
DISTRICT 11				
I-5/SR-56	EDB	KLI	SD Co VC	December 27, 1999: Second basin breeding mosquitoes; site abated with Altosid pellets. January 24, 2000: Breeding found in the second basin; site treated with Altosid. January 31, 2000: Breeding found; no abatement performed. February 7, 2000: Breeding found; no abatement performed. February 14: Breeding noted in the second basin; no abatement performed.
I-15/SR-78	EDB	KLI	SD Co VC	None noted during routine inspection.
I-5/La Costa (West)	IB	KLI	SD Co VC	None noted during routine inspection.
I-5/La Costa (East)	WB	KLI	SD Co VC	January 18, 2000: Breeding noted and sampled at the north end of the basin; no treatment performed. January 31, 2000: Breeding found; no abatement performed. February 7, 2000: Breeding found; no abatement performed.
I-5/Manchester (East)	EDB	KLI	SD Co VC	None noted during routine inspection.
Kearny Mesa MS	StormFilter (Perlite/Zeolite)	KLI	SD Co VC	None noted during routine inspection.
Escondido MS	MF	KLI	SD Co VC	None noted during routine inspection.
La Costa Park & Ride	MF	KLI	SD Co VC	None noted during routine inspection.
SR-78/I-5 Park & Ride	MF	KLI	SD Co VC	None noted during routine inspection.
Melrose Ave/SR-78	Bio Swale	KLI	SD Co VC	None noted during routine inspection.
I-5 Palomar Airport Road	Bio Swale	KLI	SD Co VC	None noted during routine inspection.
Carlsbad MS	Bio Strip/IT	KLI	SD Co VC	None noted during routine inspection.

ENVIRONMENTAL ISSUES

Dudek and Associates surveyed the BMP's in late November 1999, mid-December 1999, early January 2000, and late February 2000. The surveys consisted of reviewing the sites for potential endangered, threatened, or sensitive species issues. Conditions reviewed included presence of burrows, presence of water, presence of nesting birds or suitable habitat, and focused surveys for light-footed clapper rail and salt marsh skipper at select coastal sites.

Botta's pocket gopher and California ground squirrel damage increased as the quarter wore on, particularly at the SR-91/I-605 interchange cluster. In order to curtail the damage to BMP's it has been recommended that gopher trapping occur at the I-605/SR-91 biofiltration strip and swale, Cerritos maintenance station, I-5/I-605 biofiltration swale, I-15/SR-78 extended detention basin, SR-78/Melrose Avenue biofiltration swale, and I-5/Palomar Airport Road biofiltration swale. No sensitive species issues have arisen as a result of the burrows.

Puddled or standing water has been present on approximately 10% of the BMP's during November through January; February's survey was conducted during rainy weather so the presence of water was not noted. Despite the occasional presence of water, no sensitive species were ever detected.

No nesting birds were detected or expected during the Winter quarter. Surveys for clapper rail and salt marsh skipper were negative. Finally, the California Department of Health Services Vector Biology and Control placed a live-trap array at the I-5/I-56 extended detention basin in late November, capturing two native deer mice.

A letter from the USFWS provided further direction in the type of surveys that should be conducted for light-footed clapper rail (visual as opposed to tape playback) and requested coordination with regard to maintenance at the La Costa wet basin. This letter is included in Appendix F.

WEATHER

Precipitation data for Los Angeles and San Diego were obtained from NOAA (see tables below which list data for the quarter). Precipitation data since the beginning of the 1999-2000 season for 2 gages in Los Angeles and 2 gage in San Diego is provided in Appendix J.

The data presented here is for reference only. The actual rainfall at individual BMP sites will vary from the values given in the table. The data presented above for Los Angeles is as of 4:00 p.m. for the preceding 24 hours on the date indicated. For San Diego, is as of 5:00 p.m. for the preceding 24 hours.

December 1999

Los Angeles – Downtown/USC				San Diego			
Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)
1	0.00	16	0.00	1	0.00	16	0.00
2	0.00	17	0.00	2	0.00	17	0.00
3	0.00	18	0.00	3	0.00	18	0.00
4	0.00	19	0.00	4	0.00	19	0.00
5	0.00	20	0.00	5	0.00	20	0.00
6	0.00	21	0.00	6	0.00	21	0.00
7	0.00	22	0.00	7	0.00	22	0.00
8	0.00	23	0.00	8	0.00	23	0.00
9	0.00	24	0.00	9	0.00	24	0.00
10	0.03	25	0.00	10	0.03	25	0.00
11	0.00	26	0.00	11	0.00	26	0.00
12	0.00	27	0.00	12	0.00	27	0.00
13	0.00	28	0.00	13	0.00	28	0.00
14	0.00	29	0.00	14	0.00	29	0.00
15	0.00	30	0.00	15	0.00	30	0.00
		31	0.00			31	0.00

January 2000

Los Angeles – Downtown/USC				San Diego			
Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)
1	0.12	16	0.00	1	0.28	16	0.03
2	0.00	17	0.02	2	0.04	17	Trace
3	0.00	18	0.01	3	0.00	18	0.00
4	0.00	19	0.00	4	0.00	19	0.00
5	0.00	20	0.00	5	0.00	20	0.00
6	0.00	21	0.00	6	0.00	21	0.00
7	0.00	22	0.00	7	0.00	22	0.00
8	0.00	23	0.02	8	0.00	23	0.00
9	0.00	24	0.00	9	0.00	24	0.00
10	0.00	25	0.42	10	0.00	25	Trace
11	0.00	26	0.14	11	0.00	26	0.03
12	0.00	27	0.00	12	0.00	27	0.00
13	0.00	28	0.00	13	0.00	28	0.00
14	0.00	29	0.00	14	0.00	29	0.00
15	0.00	30	0.03	15	0.00	30	Trace
		31	0.21			31	0.08

February 2000

Los Angeles – Downtown/USC				San Diego			
Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)	Day	Precip. (Inches)
1	0.00	16	0.58	1	0.00	16	0.07
2	0.00	17	0.08	2	0.00	17	0.14
3	0.00	18	0.00	3	0.00	18	0.00
4	0.00	19	0.00	4	0.00	19	0.00
5	0.00	20	0.29	5	0.02	20	0.33
6	0.00	21	1.63	6	0.00	21	1.19
7	0.00	22	0.00	7	0.00	22	0.58
8	0.00	23	1.09	8	Trace	23	0.08
9	0.00	24	0.00	9	0.00	24	0.63
10	0.41	25	0.00	10	0.03	25	0.00
11	0.12	26	0.00	11	0.09	26	0.00
12	0.62	27	0.24	12	0.39	27	Trace
13	0.26	28	0.00	13	0.06	28	Trace
14	0.44	29	0.00	14	0.06	29	0.00
15	0.00			15	0.00		

Appendix A
Quarterly Status 7 Meeting Minutes



Robert Bein, William Frost & Associates
PROFESSIONAL ENGINEERS, PLANNERS & SURVEYORS

JN: 34123,34218

STORMWATER PLANNING SERVICES
CONTRACT NO. 43A0004A
Meeting Minutes

ISSUE VERSION: Final

MEETING NO.: 7

DATE: 12/15/99

TIME: 9:00 am

LOCATION: RBF

SUBJECT: Meeting Minutes for Quarterly Status Meeting No. 7

Prepared by: S. Taylor

Approved by: 

(Signature)

Date Prepared: 12/20/99

Attendee Names / Company

Steve Borroum/Caltrans
Brian Currier/Caltrans-UCD
Lanny Chronert/Caltrans
Emilio Viramontes/Caltrans
Pete Van Riper/Caltrans
Richard Gordon/Caltrans
Doug Failing/Caltrans
Bob Wu/Caltrans
Sayra Ramos/Caltrans
Cid Tesoro/Caltrans
Jim McCarthy/Caltrans
Rick Graff/SD BayKeeper
Chris May/NRDC
John Barth/SD BayKeeper
Jeremy Johnstone/EPA Region 9
Rich Horner/NRDC
Everett DeLano/NRDC
Bruce Reznik/SD BayKeeper
G. Wakoli Wekesa/DHS
Jeanne-Marie Lane/DHS
Mark Moser/MW-C

Attendee Names / Company

Ed Othmer/Law/MW-C
Margot Griswold/Earthworks/MW-C
Gary Friedman/MW-C
Byron Berger/Law/MW-C
Frances Palmer/RBF
Trevor Smith/RBF
Brock Ortega/Dudek/RBF
Bill Whittenberg/RBF
Mike Barrett/UT/RBF
Anna Lantin/RBF
Scott Taylor/RBF
Ann Walker/RBF
Dean Messer/LWA
Richard Haller/CDM
Jeff Endicott/CDM
Pat Kinney/KLI
Matt Zapala/KLI
Mark Williams/BC
Bob Finn/BC
Alan Batdorf/BC

Copies To: File, Jeff Joseph/Caltrans, Bill Evans/Caltrans

The following items presented summarize the substantive items discussed or issues resolved at the above meeting to the best of the writer's memory.

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
1.	Agenda Items 1 and 2. EPA indicated that the Pilot study and San Diego Water Quality Control Study (SDWQCS) may not fulfill the objectives of the consent decree. EPA is in a 'wait and see' mode to determine if the SDWQCS will fulfill the consent decree requirements. If they don't agree that the final report meets the requirements of the consent decree, they will seek program revisions and to collect stipulated penalties.	FYI	12/15		Caltrans
2.	Caltrans indicated that the SDWQCS is proceeding, but that there are few products to share at this time. The study team has completed some monitoring last winter and will monitor again this winter, Caltrans has also met with the Regional Board to discuss the study program. Caltrans has also discussed the study with those parties that may fund the programs. Caltrans has no doubt that the study will successfully fulfill the requirements of the consent decree.	FYI	12/15		
3.	SD BayKeeper inquired about the water quality studies in San Diego, relative to scope and status, and when copies would be available for review. Caltrans indicated that the studies were not complete yet and would not be for about 1 year, the monitoring data needs to be compiled and reviewed in total. Caltrans is monitoring receiving waters this winter, one location may be changing based on comments received from the Regional Board.	FYI	12/15		
4.	NRDC had three brief comments: 1) Liked the location for the meeting. 2) Inquired about the availability of Caltrans' SWMP. Caltrans indicated that the SWMP is out, and that staged mailings, as copies are available, are occurring. 3) Meeting minutes: Two versions are included in the current Status report. Caltrans intends to final both versions. NRDC objects to having two final versions. It was agreed that attorneys from NRDC and Caltrans would discuss this issue.	FYI	12/15	3/15	Caltrans/NRDC
5.	Agenda Item 3. Non stormwater discharges – District 7: Non stormwater discharge at Altadena MS, broken irrigation line from car hitting the line was the cause. In the future, MS staff will test the sprinklers before they will go home. Began weekly non-stormwater inspections during the week of November 21st at the Pilot Maintenance Stations and other MS sites in the District. The only other discharge was at the Via Verde park and ride, again due to the irrigation system. This P&R is maintained by the City of San Dimas, not Caltrans. Caltrans has spoken to the City about correcting the over-irrigation problem. NRDC inquired about the non-stormwater reports, the District noted that the NRDC attorney should be receiving the reports through the District 7 legal counsel.	FYI	12/15		District 7
6.	Non-stormwater discharges – District 11: No non-stormwater discharges to report at this time. Report forwarded early this week by the District. KLI performed the inspections, no non-stormwater discharges found. District 11 will track the weekly inspections. NRDC inquired about the language in the report table, terms are different, i.e., sometimes it says no water present, sometimes says no evidence of water. Caltrans responded that this is language is meant to be equivalent, and that the changed wording was not intentional. Plaintiff noted they are interested in	New	12/15	3/15	District 11

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
	either flow or evidence of flow. NRDC also noted that there are five sites that have had persistent water. Does Caltrans believe we are seeing the discharges, or that we are missing the discharges during the inspections? Caltrans responded that the non-stormwater flows appear to have been abated, and that we are not missing flows between inspections. NRDC further inquired as to how the evidence of flow is reported. Caltrans indicated that flows are classified as either past or present. The District will try to coordinate KLI inspections with VCD inspections, so there are not problems with interpretation of what flow is seen by which inspection team.				
7.	<p>Agenda Item 4. Metro/Paxton projects are on track and on schedule for submittal of comments from HQ back to the District, Caltrans HQ will submit comments back to the District on the 24th (December) as previously committed.</p> <p>NRDC noted that Metro/Paxton projects are more than 6 months behind schedule, and noted concern relative to being ready for monitoring by next fall.</p> <p>CDS sites: The District reported there is a problem with the bids relative to a review of the DVBE material, which was lost in review;— this adds a week to the award process. No problem in awarding to the apparent low bidder. NRDC noted that the District has previously agreed to augment the Notice to Contractor in the specifications to allow the installation of sampling equipment during construction. The District agreed to follow up on this.</p> <p>NRDC inquired as to the participation of the CDS manufacturer in assisting during construction. MW-C noted that the manufacturer will be onsite to assist, but they are not part of the United Pumping Team (low bidder).</p>	New	12/15	3/15	District 7
8.	<p>Agenda Item 5. (5a): Lakewood Park and Ride: Voltage problem, too low to start pumps. The cause was not determined. BC has installed a buck booster, the problem has been corrected. (5b): La Costa Infiltration Basin: Caltrans indicated that this will be resolved by legal counsel. District 11 will be responding to EPA's letter on this issue. Caltrans asked if the letter was coordinated between the Plaintiffs. Region 9 responded that the letter was coordinated, but it was an EPA only letter, not formally representing any of the other Plaintiffs on the issue. Caltrans indicated that Jeff Joseph will be handling the issue, Jeff has left a message and email with Laurie Kermish at EPA, they will set up a teleconference.</p>	New	12/15	1/15	Caltrans/Region 9
9.	(5c): Kearny Mesa MS: RBF explained how the media was installed by Stormwater without following established procedures for a change to the project specifications. It was decided that the perlite/zeolite media would be retained for this year, and reevaluated as to whether to change it for the following season. Caltrans noted that regardless of the media selection, only one-year of monitoring would be	New	12/15	3/15	Caltrans/Plaintiffs/ RBF

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
	<p>completed at the site after this season.</p> <p>NRDC asked why Caltrans had not shared preliminary data with Stormwater (referring to the memorandum from the manufacturer in the Quarterly Report). Caltrans responded that this was because they want the pilot program team to be comfortable with the data before it is released to the general public. Caltrans further indicated that with the plaintiffs' permission, at the time the data is shared with the pilot team, we would also share it with the public. NRDC responded that no one should get raw unprocessed data, but that for the present case, last year's data could be shared with the manufacturers. Caltrans agreed to provide last year's data to Stormwater, and with Plaintiff concurrence, will do the same with other proprietary devices.</p> <p>The following was agreed to by all parties: 1. Stormwater would be contacted for procedures relative to 'seasoning' the media in the filter, to ensure it is ready to operate at peak performance. 2. Provide Stormwater a package with last years data, 3. Meet next summer to decide if the media will be changed to compost; and, 4. The MID would be made consistent with StormFilter's recommendations regarding backflushing. No agreement has been reached to extend the time of the monitoring program. This decision would be independent of the media change; the Plaintiffs did not agree on this point. Caltrans indicated that the process as defined is a good faith effort, and any dispute resolution process would probably view this effort favorably. Caltrans may want to formally amend the Pilot Program study plan, Caltrans to speak with their Council on this issue. It was also agreed that at the end of the pilot program, the media would be sent to Stormwater for their analysis to develop a site-specific estimate as to the remaining life of the media between major maintenance activities. The OMM plan will be changed to reflect this final analysis by the manufacturer.</p>				
10.	(5d): Manchester Hydroseeding: Re-seeding done as a follow-up to construction, when initial application did not germinate in June.	FYI	12/15		
11.	(5e): 605/91 Energy dissipator. The original construction over-grouted the dissipator, resulting in flow bypassing the basin. The grouting was chipped out and the weir plate raised 30mm. The Contractor was responsible for the cost of these changes.	FYI	12/15		
12.	(5f): Altadena: MW-C explained why the spreader ditch is retaining water. The source of water is rain, and per the MID the spreader ditch drain plug is closed during the winter. The Plaintiffs suggested that Caltrans consider draining the spreader ditch after each storm to avoid the problems of vector abatement. Caltrans directed MW-C to work with RBF to change the MID to include this suggestion. Caltrans also directed MW-C to develop an alternative design for the spreader ditch so that it would not retain water. This alternative design is to be documented in the Summary Design Report.	FYI	12/15	3/15	MW-C/RBF

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
13.	<p>Agenda Item 6. Vector Activities: Vector Issues Summary: 13 abatement actions this quarter, 12 in District 7. San Diego had some abatement at a detention basin (I-5/SR 56) since breeding was occurring on a regular basis. Altosid for abatement. It was noted that the I-5/SR 56 site is close to a number of mosquito sources. DHS activities: The U.S. survey report is behind schedule since the primary author has left DHS employ. The report is scheduled to be completed on Jan 15, 2000. The report scope will be expanded to include a questionnaire focused on the abatement practices of other vector districts in other states. Production study: Underway, collecting data in September. The study used to incorporate primary sites (DHS) and secondary sites, surveyed by the VCDs. DHS is now treating every site as a primary site.</p> <p>Database: DHS is currently working on technical issues with the database. DHS will provide an updated version of the database to RBF so that it can be included as a part of the Pilot Program database. DHS is also working to ensure that sampling is consistent between the vector districts. SD Baykeeper indicated that monitoring should be completed at all District 11 sites through 2001.</p> <p>The adult mosquito monitoring program is scheduled to terminate in two weeks. Dr. Walton will then analyze the data set. Caltrans will meet with Dr. Walton to discuss the results of the adult mosquito study at end of January and determine if it would appear useful to monitor for an additional year. NRDC asked if there are any findings from the control vs. treatment (BMP sites) pairs in the adult study. LWA indicated that Dr. Walton does not want to draw conclusions until he has had the opportunity to review the entire data set. Caltrans indicated that the raw data from the adult study would be shared with the Plaintiffs as soon as possible, with a target of the next bi-weekly call.</p> <p>SD BayKeeper noted that the DHS position that the sites should be monitored in San Diego for two years (for vectors) through 2001 supports the SDBK assertion that accompanying water quality monitoring should be continued through 2001 at all sites.</p>	New	12/15	1/20	LWA
14.	<p>Agenda Item 7: Biology: Gophers and squirrels were the main issues this quarter. Two survey letters that were forwarded to the Fish and Wildlife Service were distributed and discussed. The first letter concerns the La Costa Wet Basin and provides a survey protocol for the light footed clapper rail. The second letter concerns coastal locations with saltgrass, and provides a survey protocol for the salt marsh skipper. The purpose of the letters is to begin an early consultation with the Service relative to potential endangered species harborage at the pilot sites. NRDC noted that this appeared to be a follow-up to the Plaintiffs suggestion from the prior quarterly status meeting. Caltrans indicated that they would keep the Plaintiffs informed of any response from the service.</p>	FYI	12/15	New	
15.	<p>Agenda Item 8: OMM O&M Cost Data: RBF reviewed the cost data and graphs in the Status Report.</p>				

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
	NRDC asked if backup data was available by task for the summary hours shown on the spreadsheet. RBF indicated that full backup is available, and could be provided with a bi-weekly report. It was also suggested that a final graph by device type be developed at the end of the study, showing average O&M cost.				
16.	<p>Agenda Item 9: OMM Activities: Brown and Caldwell Sites: All sites ready for monitoring. Noted the hydroseed application was completed in November at sites that did not meet MID required coverage requirement. The hydroseed has not sprouted yet due to lack of rainfall. NRDC asked about an area adjacent to the BMP at I-605/SR 91 that appeared disturbed (graded). BC noted that this area was outside of the pilot project. District 7 indicated they would review this situation. BC has asked DHS for suggestions to modify the MCTTs to improve inspection for vectors. DHS has yet to provide the suggested modifications.</p> <p>LAW sites: NRDC was pleased with the use of a gravel access road rather than asphalt at the I-605/SR 91 site. The maintenance access was modified due to changes in the site requested by the CHP.</p> <p>NRDC asked about the storm mobilization criteria. Law explained that the teams use the same forecast for each site, from the NWS and a private consultant. The teams also look at micro-forecasts. Region 9 asked about the maintenance of the drain inlet inserts and noted that the Rosemead station requires more maintenance than the other sites (per the OMM information provided in the Status Report).</p> <p>District 11 Sites: I-5/SR 56: SD BayKeeper asked to look into grouting the riprap at the basin inlet to abate the standing water at this location. KLI to review the feasibility of this. Reviewed the maintenance that has occurred at each site during this quarter.</p>	New	12/15	3/15	KLI
17.	<p>Agenda Item 10: Cost Workgroup Update: Caltrans introduced CDM, the 3rd party consultants for the pilot cost review. Caltrans is working on packaging the data, including the lingering elements of construction (change orders). NRDC asked what the timeline for release of the data is. Caltrans indicated the data should be ready by the first part of the year, or by the first two weeks of January. SD BayKeeper inquired if Caltrans is also putting together costs for deployment of the BMPs. Caltrans responded that a preliminary estimate would be provided to the cost work group to get the Consultants' perspective on the cost.</p>	New	12/15	1/31	Caltrans
18.	<p>Non Agenda Item: A Memo from Woodward Clyde Consultants responding to NRDC's comments on the Sod Peer Review report was handed out and discussed.</p> <p>NRDC saw the Memo as information for future reference, and believes the saltgrass is suitable for the pilot program.</p> <p>Caltrans concurred with NRDC on the use of the Woodward Clyde Memo. Caltrans remains concerned</p>	New	12/15	6/2001	Caltrans

MEETING MINUTES

Meeting Date: December 15, 1999

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ITEM	DESCRIPTION	STATUS	OPENED	DUE	ACTION FOR:
	about the saltgrass and its survivability over the summer without irrigation. After the pilot project is completed, there is a need to look at the type of plant material used for biofilters. Seed mixture, type of plant material, and planting method will be a future work item that will be explored in the Pilot Program Summary Report.				
19.	The next meeting was scheduled for March 15, 2000, at RBF. The next bi-weekly conference call was scheduled for January 13, 10am. Meeting Adjourned.				

Appendix B
Comments From Stormwater Management on Stormfilter

**Comments to Caltrans District 11 (San Diego) BMP Retrofit Pilot
Program
First year 1998 – 1999 Report
Best Management Practices (Operations, Monitoring & Maintenance)
Kearny Mesa Maintenance Station – StormFilter**

Submitted By:
Stormwater Management
2035 NE Columbia Boulevard
Portland, Oregon 97211

February 2, 2000

Overview

The following comments are organized according to sections contained within the report provided to Stormwater Management. The sections are labeled according to their section number followed by our comments.

Figure 1.3

This figure appears incongruent. Since the influent hydrograph is dictated by the storm, no comment can be made. However, the effluent hydrograph appears to be twice the volume of that recorded for the influent even though the total volume of the influent was higher than the effluent. This may indicate a flow meter error or an integration error. Interpretation of this hydrograph is not possible.

Based on peak flows provided in the effluent hydrograph, it was calculated that only 17 cartridges were activated. (Example: $[(\text{peak flow (cfs)} \times 449\text{gpm/cfs})]/15 \text{ gpm/cartridge} = \text{Number of cartridges}$)

Figure 1.4

These hydrographs are consistent with each other but the dosing effect is not observed in the effluent graph. The decline in the effluent hydrograph may arise from the loss of head as the system drains.

It is interesting to note that an influent sample was taken after the final effluent sample. Since the samples are composite, the final influent sample should not have been taken. Since this sample was taken at the end of the storm (after the first flush of pollutants), dilution of the influent may have occurred.

Cartridges activated (calculated): 5 cartridges (peak flow 0.17 cfs)

Figure 1.5

This figure shows influent samples taken after effluent samples. As mentioned above, this may lead to dilution error.

The hydrograph shows activation of the cartridges throughout the storm. The first effluent peak at approximately 0.2-cfs suggests the activation of 6 cartridges followed by 11 cartridges (at 0.35 cfs). The last peak at 0.85-cfs suggests the activation of the entire first vault (25 cartridges). The 0.85 peak may have produced the observed watermark about 6 inches up the second vault's cartridge hood.

Section 1.2.3 Preliminary BMP Performance Evaluation

With only three captured events, it is difficult to provide a full assessment. However, it seems that the data improve with each event. This is seen the total metals, TKN and $\text{NO}_3\text{-N}$ removals. As stated in the report, dissolved metals removal varied, however, removal of both dissolved copper and zinc were observed during each event. The dissolved lead concentrations are extremely low with possible variations in samples being within analytical error.

Total phosphorus was decreased during Event 3 and 4 and seemed to be maturing. The release in Event 5 may have arisen due to the resuspension of sediment observed during this event. This may not be the case since a reduction in TKN was observed even though resuspension occurred. (Phosphorus may have been added by the 20-l borosilicate as indicated in the blank tests. With only minimal contamination, more data is required to assess phosphorus removal.)

Total Petroleum Hydrocarbons (TPH) removal was never mentioned. The three events show removals of TPH-diesel at -72%, -86% and -69%, respectively. It was indicated that Event 5's TPH should possibly be rejected due to matrix problems. This value was the lowest observed and still indicated excellent removal. The high removal of TPH is being promoted by the zeolite and perlite and should be mentioned within the report.

Mass Balance

Table One and Two show a mass balance performed based on the total flow and concentrations. Removals based on total mass are also presented. (Note: Negative values indicate a removal as used in the report.)

Table One: Mass Balance for TSS, Total-P, TKN, NO₃-N and TPH-Diesel

Event	Total Flow (ft ³)	Total Mass TSS (kg)	Total Mass Total-P (g)	Total Mass TKN (g)	Total Mass NO ₃ -N (g)	Total Mass TPH-D (g)
3-Influent	6680	24.6	68.1	340.5	77.6	1759.4
3-Effluent	5593	23.8	53.9	269.3	69.7	411.8
4-Influent	1925	3.3	9.8	103.6	22.9	272.6
4-Effluent	1438	2.6	5.3	73.3	16.3	28.5
5-Influent	7323	7.1	43.6	248.9	58.1	1.5
5-Effluent	7515	8.9	93.6	170.3	55.3	0.5
Total In	15,928	34.9	121.5	693.0	158.5	2033.4
Total Out	14,546	35.3	152.8	512.8	141.3	440.8
Mass % Removed		1.1%	25.8%	-26.0%	-10.9%	-78.3%

Table Two: Mass Balance for Total and Dissolved Metals (Cu, Pb and Zn)

Event	Total Mass Total-Cu (g)	Total Mass Total-Pb (g)	Total Mass Total-Zn (g)	Total Mass Dissolved-Cu (g)	Total Mass Dissolved-Pb (g)	Total Mass Dissolved-Zn (g)
3-Influent	11.2	7.6	64.3	4.7	0.51	32.2
3-Effluent	8.4	5.4	42.8	3.8	0.59	20.6
4-Influent	2.8	1.0	12.5	1.7	0.11	8.2
4-Effluent	1.4	0.7	7.7	0.9	0.09	5.7
5-Influent	13.9	5.8	37.3	4.1		19.7
5-Effluent	6.2	2.3	17.9	4.0		17.5
Total In	27.8	14.4	114.2	10.6	0.6	60.0
Total Out	16.0	8.4	68.4	8.7	0.7	43.7
Mass % Removed	-42.6%	-41.9%	-40.1%	-17.7%	8.7%	-27.1%

As presented, there is a slight addition of TSS. This addition is probably arising from the maturing of the media. It appears as if inert fines are being added to the effluent by the perlite media. The reason for this assumption is that total metals and TKN are being reduced even though the TSS is increasing. Another explanation may be that a seal between the drainage manifold and the cartridge is not being achieved. This would allow solids to enter the manifold by trickling through the connector at the base of the cartridge. The settled solids within the pipe would then be flushed through when the cartridges were activated. (Note: Solids were observed during the first flush of both Vault 2 and 3 during Stormwater Management's site visit on 1/11/2000. The second and third flushes did not produce the short-lived, brown-colored effluent observed during the first flushes (i.e. an indication of settled solids in the drainage manifold). SEE memo, *Re: San Diego/Kearny Mesa Site visit, January 14, 2000*))

Total phosphorus shows a 25.8% increase that arises mainly from Event 5, which had a resuspension occurring and an effluent volume higher than the influent. The previous two events show a decrease in total phosphorus.

As mentioned earlier, TPH-Diesel showed a mass removal percentage of -78.3%. This was never stated in the report.

For all metals except for dissolved lead, there was a mass decrease. The total metals showed a decrease of -40+% for Cu, Pb and Zn while the dissolved fractions for Cu and Zn were removed by -17.7% and -27.1%, respectively.

2.2 Summary of Empirical Observations and BMP Operations

Inlet Conditions

What is meant by site contamination? Does this mean that low water flows have filled the pre-sedimentation vault? The cleaning and pumping of this vault is unclear.

Media Filter

3.2 Summary of Site Inspections and Maintenance Logs –Media Filter

Sediment/Erosion Control and Standing Water

It is suggested that dry weather observations be made of the pre-sedimentation vault and forebay to the StormFilter. These should include sediment accumulation depths.

21.5-inches of standing water in the inlet is designed into the system. This inlet chamber is designed to remove heavier solids, such as sand and grit, and provide flow transition into the cartridge bay. A regulated flow into the cartridge bay is recommended to alleviate sediment resuspension. However, if it is needed, Stormwater Management can design the systems to allow for a slow dewatering of the pretreatment bay.

The 5-inches of standing water below the energy dissipaters is designed to completely drain the system during maintenance. This is a standard design from the vault manufacturer and allows for a sump pump to be used. This sump can be removed from the design if a vector problem is of concern.

Other Comments

If a calculation of the collected sediment is performed, a value of 12.6 kg of sediment was collected on the floor of the first vault's cartridge bay. This seems misleading since the mass data shows a net release of 0.4 kg of sediment. (Values used for calculation: Cartridge bay square feet = 106.7 ft², Cartridge area = 98.5 ft², Sediment area = 8.2 ft², sediment depth = 2.08e-2 ft (0.25-inches) and sediment particle density of 2.6 g/ml) The difference in these two masses may be that the automated samplers are not capturing the heavier solids as they pass the sampling intake. More data is needed in conjunction with field observations to address the difference in sediment mass balance.

As noted earlier, direct observations of the cartridge bay should be made during dry weather. Assumptions can be made that the system is draining through leaks by other observations of standing water in the report. However, this is not clear since the observation dates are not given. The loss of water may also be arising through evaporation but is highly unlikely. (Note: The system usually has an inch of water in the bottom due to the base pan of the cartridge.)

**Response to Stormwater Management Inc. Comments on the Caltrans District 11
BMP Retrofit Pilot Program**

First year 1998 – 1999 Report

Best Management Practices (Operations, Monitoring & Maintenance)

Responses to Stormwater Management's comments are provided beneath their comment in *italic*.

12.0 FIGURE 1.3

This figure appears incongruent. Since the influent hydrograph is dictated by the storm, no comment can be made. However, the effluent hydrograph appears to be twice the volume of that recorded for the influent even though the total volume of the influent was higher than the effluent. This may indicate a flow meter error or an integration error. Interpretation of this hydrograph is not possible.

Response 1: Unfortunately, Stormwater Management was only provided with sections of the First Year Report that applied specifically to the Kearny Mesa Maintenance Station site. General background information on flow measurements present in the original report was not given to Stormwater Management. However, this flow information was provided to the plaintiffs in the original report. The pertinent section that addresses Stormwater Management's comment on Figure 1.3 can be found in the First Year Report under Section 1.0 Storm Water Data, Sub-Section 1.1 Hydrology, Sub-Section 1.1.3 Storm Water Runoff During Monitored Events, Paragraph Seven. The paragraph begins with: "Flow proportioning of sample aliquots..."

Based on peak flows provided in the effluent hydrograph, it was calculated that only 17 cartridges were activated. (Example: $[(\text{peak flow (cfs)} \times 449\text{gpm/cfs})]/15 \text{ gpm/cartridge} = \text{Number of cartridges}$)

13.0 FIGURE 1.4

These hydrographs are consistent with each other but the dosing effect is not observed in the effluent graph. The decline in the effluent hydrograph may arise from the loss of head as the system drains.

Response 2: Comment noted.

It is interesting to note that an influent sample was taken after the final effluent sample. Since the samples are composite, the final influent sample should not have been taken. Since this sample was taken at the end of the storm (after the first flush of pollutants), dilution of the influent may have occurred.

Response 3: Flow proportion sampling is designed to sample a storm event throughout its entirety. If sampling at the inlet should stop while flow is continuing, percent capture of the event would decrease.

Cartridges activated (calculated): 5 cartridges (peak flow 0.17 cfs)

14.0 FIGURE 1.5

This figure shows influent samples taken after effluent samples. As mentioned above, this may lead to dilution error.

Response 4: Please see Response 3.

The hydrograph shows activation of the cartridges throughout the storm. The first effluent peak at approximately 0.2-cfs suggests the activation of 6 cartridges followed by 11 cartridges (at 0.35 cfs). The last peak at 0.85-cfs suggests the activation of the entire first vault (25 cartridges). The 0.85 peak may have produced the observed watermark about 6 inches up the second vault's cartridge hood.

Response 5: Comment noted.

15.0 SECTION 1.2.3 PRELIMINARY BMP PERFORMANCE EVALUATION

With only three captured events, it is difficult to provide a full assessment. However, it seems that the data improve with each event. This is seen the total metals, TKN and NO₃-N removals. As stated in the report, dissolved metals removal varied, however, removal of both dissolved copper and zinc were observed during each event. The dissolved lead concentrations are extremely low with possible variations in samples being within analytical error.

Total phosphorus was decreased during Event 3 and 4 and seemed to be maturing. The release in Event 5 may have arisen due to the resuspension of sediment observed during this event. This may not be the case since a reduction in TKN was observed even though resuspension occurred.

(Phosphorus may have been added by the 20-l borosilicate as indicated in the blank tests. With only minimal contamination, more data is required to assess phosphorus removal.)

Response 6: As noted, only three events were captured. It is not only difficult to provide a full assessment, it is inappropriate to attempt one at this time. We agree with initial comments on evaluation of the dissolved lead and total phosphorus data. These issues will be evaluated in detail once we have an adequate data set.

Total Petroleum Hydrocarbons (TPH) removal was never mentioned. The three events show removals of TPH-diesel at -72%, -86% and -69%, respectively. It was indicated that Event 5's TPH should possibly be rejected due to matrix problems. This value was the lowest observed and still indicated excellent removal. The high removal of TPH is being promoted by the zeolite and perlite and should be mentioned within the report.

Response 7: TPH samples are taken as grab samples. These samples cannot be used to evaluate performance of the BMP. Evaluations of TPH removal would require a series of grab samples at both the influent and effluent using flow meter readout data to determine sampling times.

16.0 MASS BALANCE

Table One and Two show a mass balance performed based on the total flow and concentrations. Removals based on total mass are also presented. (Note: Negative values indicate a removal as used in the report.)

16.1 Table One: Mass Balance for TSS, Total-P, TKN, NO₃-N and TPH-Diesel

Event	Total Flow (ft ³)	Total Mass TSS (kg)	Total Mass Total-P (g)	Total Mass TKN (g)	Total Mass NO ₃ -N (g)	Total Mass TPH-D (g)
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3-Influent	11.2	7.6	64.3	4.7	0.51	32.2
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4-Effluent	1.4	0.7	7.7	0.9	0.09	5.7
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Mass % Removed	-42.6%	-41.9%	-40.1%	-17.7%	8.7%	-27.1%

As presented, there is a slight addition of TSS. This addition is probably arising from the maturing of the media. It appears as if inert fines are being added to the effluent by the perlite media. The reason for this assumption is that total metals and TKN are being reduced even though the TSS is increasing. Another explanation may be that a seal between the drainage manifold and the cartridge is not being achieved. This would allow solids to enter the manifold by trickling through the connector at the base of the cartridge. The settled solids within the pipe would then be flushed through when the cartridges were activated. (Note: Solids were observed during the first flush of both Vault 2 and 3 during Stormwater Management's site visit on 1/11/2000. The second and third flushes did not produce the short-lived, brown- colored effluent observed during the first flushes (i.e. an indication of settled solids in the drainage manifold). SEE memo, Re: San Diego/Kearny Mesa Site visit, January 14, 2000))

Response 8: Comments noted. There are a number of different approaches for calculation of BMP e; the proposed methodology in the DII BMP Retrofit Pilot Scoping Study will be followed.

Total phosphorus shows a 25.8% increase that arises mainly from Event 5, which had a resuspension occurring and an effluent volume higher than the influent. The previous two events show a decrease in total phosphorus.

Response 9: This is a plausible explanation based upon the chemistry and field observations however it is premature to reach this conclusion with three data points.

As mentioned earlier, TPH-Diesel showed a mass removal percentage of -78.3%. This was never stated in the report.

Response 10: Please refer to Response 7.

For all metals except for dissolved lead, there was a mass decrease. The total metals showed a decrease of -40+% for Cu, Pb and Zn while the dissolved fractions for Cu and Zn were removed by -17.7% and -27.1%, respectively.

Response 11: Please refer to response 8.

17.0

18.0 2.2 SUMMARY OF EMPIRICAL OBSERVATIONS AND BMP OPERATIONS

19.0 INLET CONDITIONS

What is meant by site contamination? Does this mean that low water flows have filled the pre-sedimentation vault? The cleaning and pumping of this vault is unclear.

Response 12: The pre-sedimentation vault was pumped and cleaned post-construction pre-monitoring. However, prior to the first storm event, the chamber had been re-filled with water, suggesting a non-storm water discharge. These events were discussed in detail with the plaintiffs in the July Quarterly Status meeting when the First Year Report was presented. These events led to weekly non-storm water discharge inspections at the Kearny Mesa site.

20.0 MEDIA FILTER

3.2 Summary of Site Inspections and Maintenance Logs –Media Filter

21.0 SEDIMENT/EROSION CONTROL AND STANDING WATER

It is suggested that dry weather observations be made of the pre-sedimentation vault and forebay to the StormFilter. These should include sediment accumulation depths.

Response13: Presently, maintenance crews inspect the site on a monthly basis during periods of dry weather and sediment accumulation is part of the maintenance inspection.

21.5-inches of standing water in the inlet is designed into the system. This inlet chamber is designed to remove heavier solids, such as sand and grit, and provide flow transition into the cartridge bay. A regulated flow into the cartridge bay is recommended to alleviate sediment resuspension. However, if it is needed, Stormwater Management can design the systems to allow for a slow dewatering of the pretreatment bay.

The 5-inches of standing water below the energy dissipaters is designed to completely drain the system during maintenance. This is a standard design from the vault manufacturer and allows for a sump pump to be used. This sump can be removed from the design if a vector problem is of concern.

Response 14: Comment noted.

22.0 OTHER COMMENTS

If a calculation of the collected sediment is performed, a value of 12.6 kg of sediment was collected on the floor of the first vault's cartridge bay. This seems misleading since the mass data shows a net release of 0.4 kg of sediment. (Values used for calculation: Cartridge bay square feet = 106.7 ft², Cartridge area = 98.5 ft², Sediment area = 8.2 ft², sediment depth = 2.08e-2 ft (0.25-inches) and sediment particle density of 2.6 g/ml) The difference in these two masses may be that the automated samplers are not capturing the heavier solids as they pass the sampling intake. More data is needed in conjunction with field observations to address the difference in sediment mass balance.

Response 15: Comment noted

As noted earlier, direct observations of the cartridge bay should be made during dry weather. Assumptions can be made that the system is draining through leaks by other observations of standing water in the report. However, this is not clear since the observation dates are not given.

The loss of water may also be arising through evaporation but is highly unlikely. (Note: The system usually has an inch of water in the bottom due to the base pan of the cartridge.)

Response 16: Please see Comment 13.

Appendix C
Comments from Bob Pitt on MCTT

**ROBERT PITT, PH.D., P.E., DEE ENVIRONMENTAL ENGINEER
2137 FARLEY RD. BIRMINGHAM AL 35226 (205) 934-8434**

February 5, 2000

William Whittenberg, P.E., DEE
Robert Bein, William Frost & Associates
14725 Alton Parkway
P.O. Box. 57057
Irvine, CA 92619-57057

Dear Bill:

This letter is my trip report for my visit to the Caltrans MCTT sites on January 14, 2000. I was impressed with the professional job associated with the construction of the facilities and was pleased by the interest expressed by the Caltrans personnel who we met during the site visits. The following comments are based on my observations during this visit, plus further thought to your email questions pertaining to holding times in the units.

1) Anticipated pumping after 24 to 36 hours

Because of the storage/treatment volume provided at the MCTT sites, a holding period of 24 to 36 hours is adequate for maximum performance. If the storage volume was less than about 0.6 inches of runoff, then less than the maximum level of treatment would be provided for these holding times. For these conditions, the level of control expected should be very good. The only concern would be preventing turbulence that could scour out the fine silt that will be trapped in the main settling tanks.

The pumping rate (40 gpm) from the main settling chamber to the filter chamber will be about 40 ft/day at Via Verde, and about 20 ft/day at Lakewood. These may be a bit fast, but the several feet of storage volume above the filters should allow sufficient storage as the filtration rate of the filters slows with use. It may be necessary to reduce the pumping rate in the future if excessive backing up of water is observed. Reducing the pumping rate may also reduce scour, if that is observed during operation.

Overall, the 24 to 36 hr holding periods and 40 gpm pumping rates should be satisfactory, but can be easily modified if necessary in the future if treatment performance is degraded.

Rough/Relative Estimates of MCTT Performance for Different Operating Conditions (24 hour holding time)

Estimated Performance	5 ft. max. stage in settling chamber	7 ft. max. stage in settling chamber	9 ft. max. stage in settling chamber
Constant removal above runoff depth (in):	0.6	0.6	0.6
Toxicity control in main settling chamber (%):	82	75	68
Overall toxicity control in MCTT:	≈100	98	88
Overall suspended solids control in MCTT:	90	83	75
Overall lead control in MCTT:	98	90	82
Overall zinc control in MCTT:	98	90	82
Overall control for most organic toxicants in MCTT:	≈100	98	88
Overall COD control in MCTT:	59	54	49
Overall nitrates control in MCTT:	26	24	22

Rough/Relative Estimates of MCTT Performance for Different Operating Conditions (36 hour holding time)

Estimated Performance	5 ft. max. stage in settling chamber	7 ft. max. stage in settling chamber	9 ft. max. stage in settling chamber
Constant removal above runoff depth (in):	0.8	0.8	0.8
Toxicity control in main settling chamber (%):	94	84	78
Overall toxicity control in MCTT:	≈100	≈100	≈100
Overall suspended solids control in MCTT:	≈100	92	86
Overall lead control in MCTT:	≈100	≈100	≈100
Overall zinc control in MCTT:	≈100	≈100	≈100
Overall control for most organic toxicants in MCTT:	≈100	≈100	≈100
Overall COD control in MCTT:	68	60	56
Overall nitrates control in MCTT:	30	27	25

2. Maintenance Issues Apparent During Field Visit

- I heard a lot about mosquito issues while at the site visits. Several suggestions came to mind that may make managing them easier, although I am certainly not an insect control specialist. The covers on the diversion chamber and the grit chamber are wooden (photo 1) and don't seal tightly. It may be possible to seal the undersides of the planked covers to reduce the ability of the mosquitos from leaving, if present (don't use plywood, any treated wood or galvanized metal). In addition, tubes (2" plastic pipe?) could be installed in the corners of the grit chamber walls (photo 2) that would pass between the bags of plastic spheres and the concrete wall and pass through the plastic support, ending just below the plastic grid support and above the standing water. These tubes could be used to deliver insecticides to the covered water surface without having to remove the bags. In addition, it was suggested that the water in the main settling chamber (photo 3) be pumped out completely between rains. I would be concerned that this would induce scour of captured sediments. A possible alternative would be to suspend an insect-proof screening over the settling chambers. In addition, this option could improve safety if a reasonably strong netting was suspended over the chamber (at the top). This strong netting could then support a finer netting sealed around the edges. This netting would also capture blown litter.
- I noticed the collection of debris near the inlet of the grit chamber (photo 2) and felt that this may require frequent cleaning. When cleaned, the removed material needs to be quantified as part of the monitoring plan. This material may be difficult to remove from between the bags. I suggested that a netting be placed under the bags, on top of the supporting grid, extending above the bags. Lines could be attached to the edges of this netting (extending up the side of the chamber) to allow easy removal of the litter after the bags are lifted out. A netting similar to the bag material would be adequate. Aquatic Ecosystems, of Apopka, FL (407-886-3939), sells stronger and relatively stiff extruded plastic netting that should work well for this application.
- I would recommend that you add more sorbent pillows to the main settling tank. Observations during operation will help you determine the actual need. They are relatively inexpensive and additional units should probably be added initially.
- The filter fabric covering the filter media (photo 4) needs to be sealed/pressed against the edge of the tank to slow water that may flow between the concrete and the fabric and reduce short-circuiting. Long lengths of aluminum edging could be used around the perimeter to allow clamping of the fabric edge, for example. Another option would be to use a complete ring of concrete blocks around the edge of the fabric.
- As noted during the field visit, the extended dry period has not allowed monitoring of the units. I hope that the monitoring "window" can be extended to allow a sufficient number of events to be monitored.

Again, thank you having me assist you on this interesting project. If you have any questions about the above, please contact me.

Sincerely,

Robert Pitt, Ph.D., P.E., DEE
Environmental Engineer



Photo 1. Wooden covers at Via Verde MCTT installation.



Photo 2. Litter collecting at inlet in grit chamber at Lakewood MCTT installation.



Photo 3. Main settling chamber at Lakewood MCTT installation.



Photo 4. Filter chamber and fabric at Lakewood MCTT installation.

Appendix D

OMM Cost Summary

APPENDIX E
ENVIRONMENTAL/BIOLOGICAL SURVEY REPORTS

**CALTRANS BMP Retrofit Pilot Program
Districts 7 and 11**

**BIOLOGICAL MONITORING REPORT
for
November 1999**

Prepared for:

Robert Bein, William Frost & Associates

14725 Alton Parkway

Irvine, CA 92619

Contact: Mr. Trevor Smith

(949) 472-3505

Prepared by:



Professional Teams for Complex Projects

605 Third Street

Encinitas, CA 92024

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(760) 942-5147

Monitoring Report • Caltrans BMP Retrofit Pilot Program

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Monitoring Report • Caltrans BMP Retrofit Pilot Program

INTRODUCTION

This report is intended to describe biological monitoring efforts in regards to the California Department of Transportation (Caltrans) Best Management Practices facilities (BMP) pilot study occurring in Districts 7 and 11 (Los Angeles and San Diego respectively). The pilot study, BMP locations, and BMP descriptions have been well described previously by Robert Bein, William Frost and Associates (RBF 1999).

Seven District 7 BMP sites (*Figure 1*) and nine District 11 BMP sites (*Figure 2*) are monitored monthly by Dudek and Associates, Inc. (DUDEK). DUDEK previously determined that the 16 sites may have the potential to become significant from a wildlife perspective. DUDEK Wildlife biologist Brock A. Ortega visited the District 11 BMPs and District 7 BMP's on 19, 20 and 24 November 1999. Survey conditions on both days were appropriate for detection of wildlife (i.e., clear skies, mild temperatures, light breezes).

Table 1 presents a synopsis of potential issues related to each BMP site. A discussion of each BMP site follows the table.

TABLE 1
BMP LOCATIONS, TYPE, POTENTIAL BIOLOGICAL ISSUES
AND SUMMARY OF FINDINGS

Location; BMP Type	Sensitive Species Activity/Type	Action	Gopher Mounds/ Action*	Ground Squirrel Holes/ Action*	Nesting Birds	Standing Water	Species Observed
I-605/SR-91; InfBa	No	N/A	Yes/None	No	No	No	fence lizard
I-5/I-605; ExtDB	No	N/A	Yes/None	No	No	Yes	fence lizard
I-605/SR-91; BiofSt	No	N/A	No	No	No	No	fence lizard
Cerritos MS; BiofSw	No	N/A	Yes/trap	No	No	No	western fence lizard
I-5/I605; BiofSw	No	N/A	Yes/None	No	No	Yes	None
I-605/SR-91; BiofSw	No	N/A	Yes/trap	Yes/close holes	No	No	mourning dove
I-5/Manchester; ExtDB	No	N/A	No	No	No	No	None
I-5/SR-56; ExtDB	No	N/A	No	No	No	No	black phoebe, mourning dove, western meadow lark, song sparrow
I-15/SR-78; ExtDB	No	N/A	Yes/trap	No	No	No	house finch

- Extended Detention Basin:**
- ① SR-78/I-15
 - ② I-5/Manchester Avenue (east)
- Infiltration Trench/Biofilter (strip/swale):**
- ③ Carlsbad MS
 - ④ I-5 (south)/Palomar Airport Road
 - ⑤ SR-78 (east)/Melrose Drive Exit
- Infiltration Basin:**
- ⑥ I-5/La Costa Avenue (northwest)
- Wet Basin:**
- ⑦ I-5/La Costa Avenue (southeast)
- Media Filter:**
- ⑧ La Costa P&R
 - ⑨ I-5/SR-78 Interchange P&R
- Extended Detention Basin:**
- ⑩ I-5/SR-56 Interchange

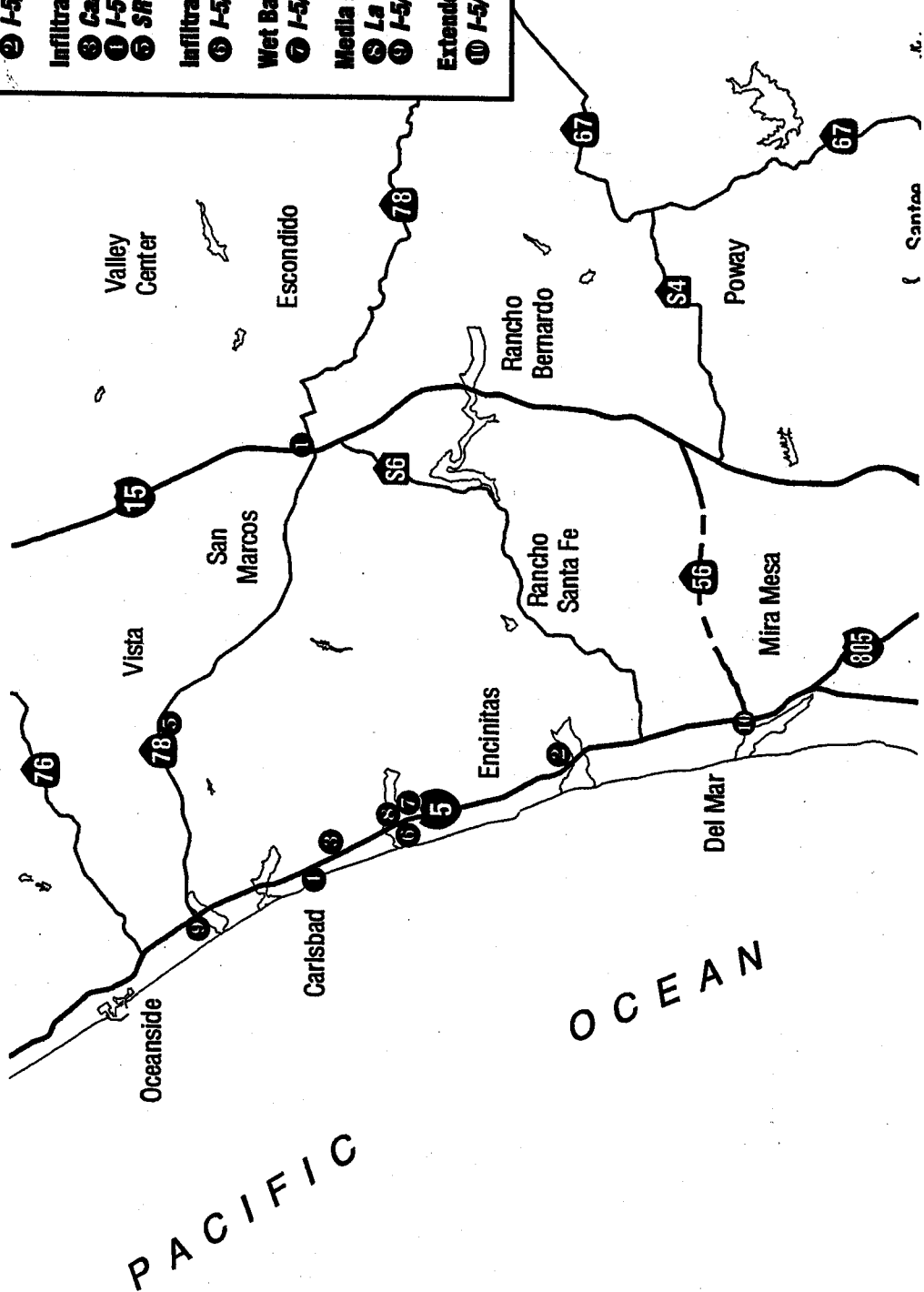


FIGURE 2

Caltrans BMP Retrofit Pilot Program, LA & SD Counties - Biological Monitoring Report
Regional Location Map - District 11, San Diego

Monitoring Report • Caltrans BMP Retrofit Pilot Program

605/91 Interchange Biofiltration Strip

There was no gopher or ground squirrel activity. The grass looks to be in good shape with the exception of the newly planted area. The adjacent areas are well maintained but gopher activity is present and should be watched closely. No sensitive species were detected or expected.

There are no recommendations at this time.

605/91 Interchange Infiltration Basin

There is abundant gopher activity present within the basin. An increase in ground squirrel burrows are evident around the perimeter of the BMP adjacent to the access road. No sensitive species were detected or expected.

There are no maintenance recommendations at this time. However, it is recommended that the ground squirrel activity will be closely watched and burrows closed as encountered. If the problem gets worse, then control methods will be recommended.

5/605 Interchange Extended Detention Basin

No gopher or ground squirrel burrows were evident within the BMP; only the perimeter. No sensitive species were detected or expected.

There are no recommendations at this time.

5/605 Interchange Biofiltration Swale

No ground squirrel burrows were present. Pocket gopher burrows were lightly distributed throughout the BMP. No sensitive species were detected or expected. Standing water was present at the inlet; however, there were no biological issues associated with the water.

There are no recommendations at this time.

Cerritos Maintenance Station/91 Biofiltration Swale

There still are gopher mounds distributed at the downstream end of the BMP. No ground squirrel burrows were evident within the BMP. No sensitive species were detected or expected. Abundant reptile life is present at this and the other 91/605 BMPs.

Gopher trapping should occur/continue to minimize the amount of herbivory on the grass filter. However, gopher mounds are not expected to create sensitive species habitat.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

DISTRICT 11 (SAN DIEGO) BMP SITES

5/56 Interchange Extended Detention Basin

No gopher mounds or ground squirrel burrows were detected. Shrubs at the south end have been trimmed. No sensitive species were detected or expected. Eight small mammal live traps were present. The traps are part of a study being conducted by the California Department of Health Services Vector Biology and Control (916) 445-4800. Two deer mice (*Peromyscus maniculatus*) were present in the traps.

There are no recommendations at this time.

5/Manchester Avenue Extended Detention Basin

No ground squirrel or pocket gopher activity was evident. No standing water was present. There are no sensitive species issues at this time.

There are no recommendations at this time.

5/La Costa Avenue Wet Basin

There were no gopher mounds or ground squirrel burrows in or in the vicinity of the BMP. Standing water puddles are adjacent to the basin between it and the overflow channel; however, there are no biological issues associated with this. There are no sensitive species issues at this time. Many wetland wildlife species are now utilizing the site. Emergent wetland vegetation now approximates 15% of the total basin surface area.

There are no recommendations at this time.

La Costa Avenue Media Filter

There are no issues at the media filter at this time. There are no recommendations.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

5/La Costa Avenue Infiltration Basin

There were no gopher mounds or ground squirrel burrows detected. The standing water has completely been absorbed or evaporated. No sensitive species were detected or expected at this time.

There are no recommendations at this time.

5/Palomar Airport Road Biofiltration Swale

There were a few gopher mounds distributed throughout. Ground squirrel burrows were present adjacent to the right-of-way fence. The filter grass is lush. There were no sensitive species issues.

It is recommended that trapping occur for gophers and baiting for ground squirrels be conducted.

78/Melrose Drive Biofiltration Swale

A few gopher mounds were detected. The filter grass was thick but appeared to have stopped growing for the year. A few ground squirrel burrows were present. No sensitive species were present.

It is recommended that the gophers are trapped and the ground squirrel burrows be closed.

78/15 Extended Detention Basin

Ground squirrel activity still is increasing adjacent to the blacktop access road which leads into the basin. Abundant ground squirrel and gopher activity is present adjacent to the BMP on slopes. No sensitive species were detected.

It is recommended that bait stations are applied near the interior ground squirrel or gopher burrows and that the burrows are compacted closed.

5/78 Media Filter

There were no issues at the media filter. There are no recommendations.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

COMMENTS

Gopher and ground squirrel activity is still more prevalent in District 7; however, the District 11 – 5/Palomar and 78/15 BMPs are still a concern. Gopher activity should not create habitat for sensitive species, however where they occur within grass filter BMPs, they should be trapped to reduce herbivory.

California ground squirrel burrows should be collapsed as they are found and persistent or increasing populations should be poisoned via bait stations.

Presently, nesting birds will not constrain maintenance activities, nor will sensitive species.

LITERATURE CITED

Robert Bein, William Frost and Associates. 1999. Project Information for Selected Best Management Practice (BMP) Sites in Caltrans Districts 7 and 11. 27pp.

CALTRANS BMP Retrofit Pilot Program Districts 7 and 11

BIOLOGICAL MONITORING REPORT for December 1999

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Monitoring Report • Caltrans BMP Retrofit Pilot Program

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Monitoring Report • Caltrans BMP Retrofit Pilot Program

INTRODUCTION

This report is intended to describe biological monitoring efforts in regards to the California Department of Transportation (Caltrans) Best Management Practices facilities (BMP) pilot study occurring in Districts 7 and 11 (Los Angeles and San Diego respectively). The pilot study, BMP locations, and BMP descriptions have been well described previously by Robert Bein, William Frost and Associates (RBF 1999).

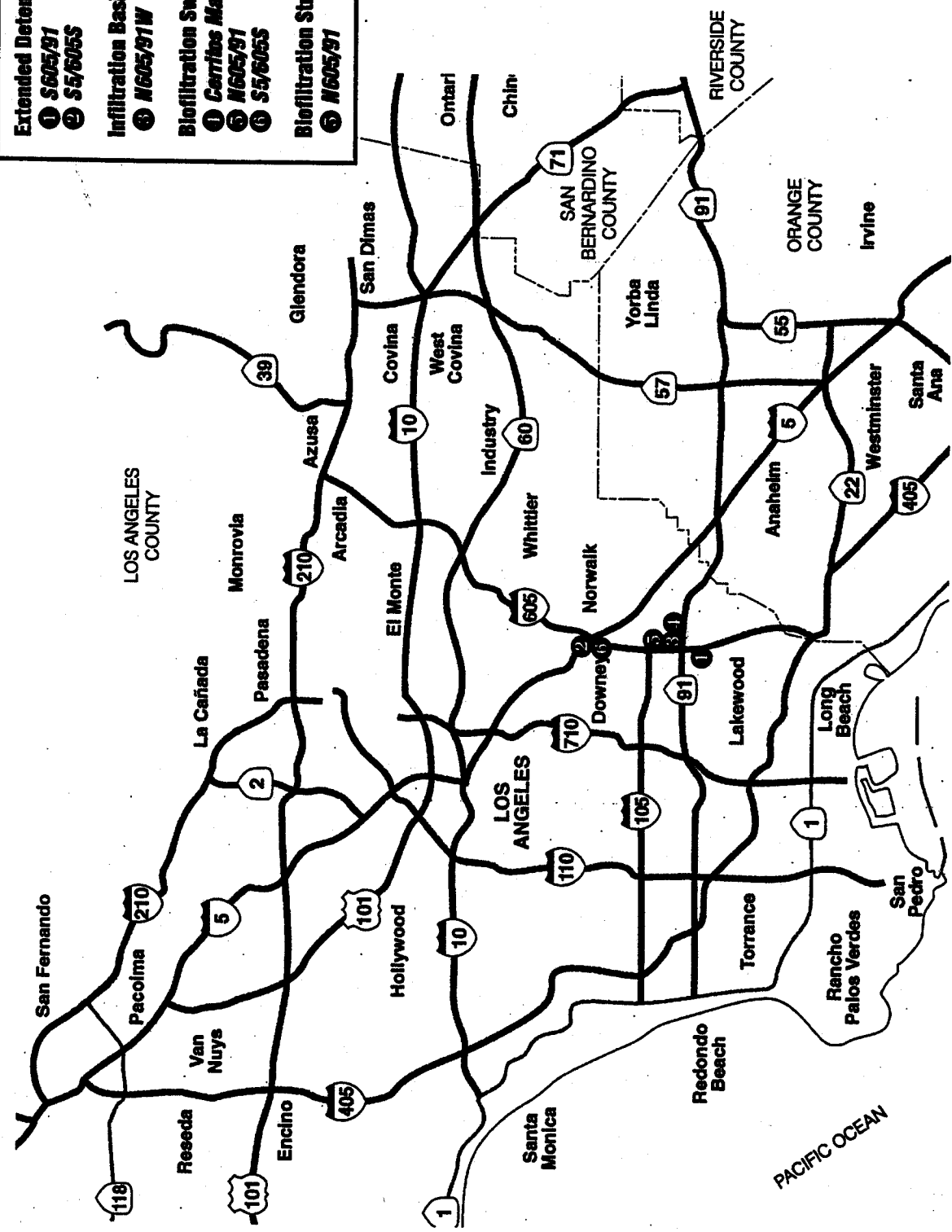
Seven District 7 BMP sites (*Figure 1*) and nine District 11 BMP sites (*Figure 2*) are monitored monthly by Dudek and Associates, Inc. (DUDEK). DUDEK previously determined that the 16 sites may have the potential to become significant from a wildlife perspective. DUDEK Wildlife biologist Brock A. Ortega visited the District 11 BMPs and District 7 BMP's in mid-December 1999. Survey conditions on both days were appropriate for detection of wildlife (i.e., clear skies, cool temperatures, light breezes).

Table 1 presents a synopsis of potential issues related to each BMP site. A discussion of each BMP site follows the table.

TABLE 1
BMP LOCATIONS, TYPE, POTENTIAL BIOLOGICAL ISSUES
AND SUMMARY OF FINDINGS

Location; BMP Type	Sensitive Species Activity/Type	Action	Gopher Mounds/ Action*	Ground Squirrel Holes/ Action*	Nesting Birds	Standing Water	Species Observed
I-605/SR-91; InfBa	No	N/A	Yes/None	No	No	No	rock dove
I-605/SR-91; InfBa	No	N/A	Yes/None	No	No	No	None
I-5/I-605; ExtDB	No	N/A	Yes/None	No	No	No	None
I-605/SR-91; BiofSt	No	N/A	Yes/watch	No	No	No	None
Cerritos MS; BiofSw	No	N/A	Yes/trap	No	No	No	None
I-5/I-605; BiofSw	No	N/A	Yes/trap	No	No	Yes	None
I-605/SR-91; BiofSw	No	N/A	Yes/trap	No	No	No	rock dove
I-5/Manchester; ExtDB	No	N/A	No	No	No	Yes	killdeer, mourning dove
I-5/SR-56; ExtDB	No	N/A	No	No	No	Yes	black phoebe, house finch
I-15/SR-78; ExtDB	No	N/A	Yes/trap	No	No	No	None

- Extended Detention Basin:**
- ① S605/91
 - ② S5/605S
- Infiltration Basin:**
- ③ N605/91W
- Biofiltration Swale:**
- ④ *Cerritos Maintenance Station/W91*
 - ⑤ N605/91
 - ⑥ S5/605S
- Biofiltration Strip:**
- ⑦ N605/91



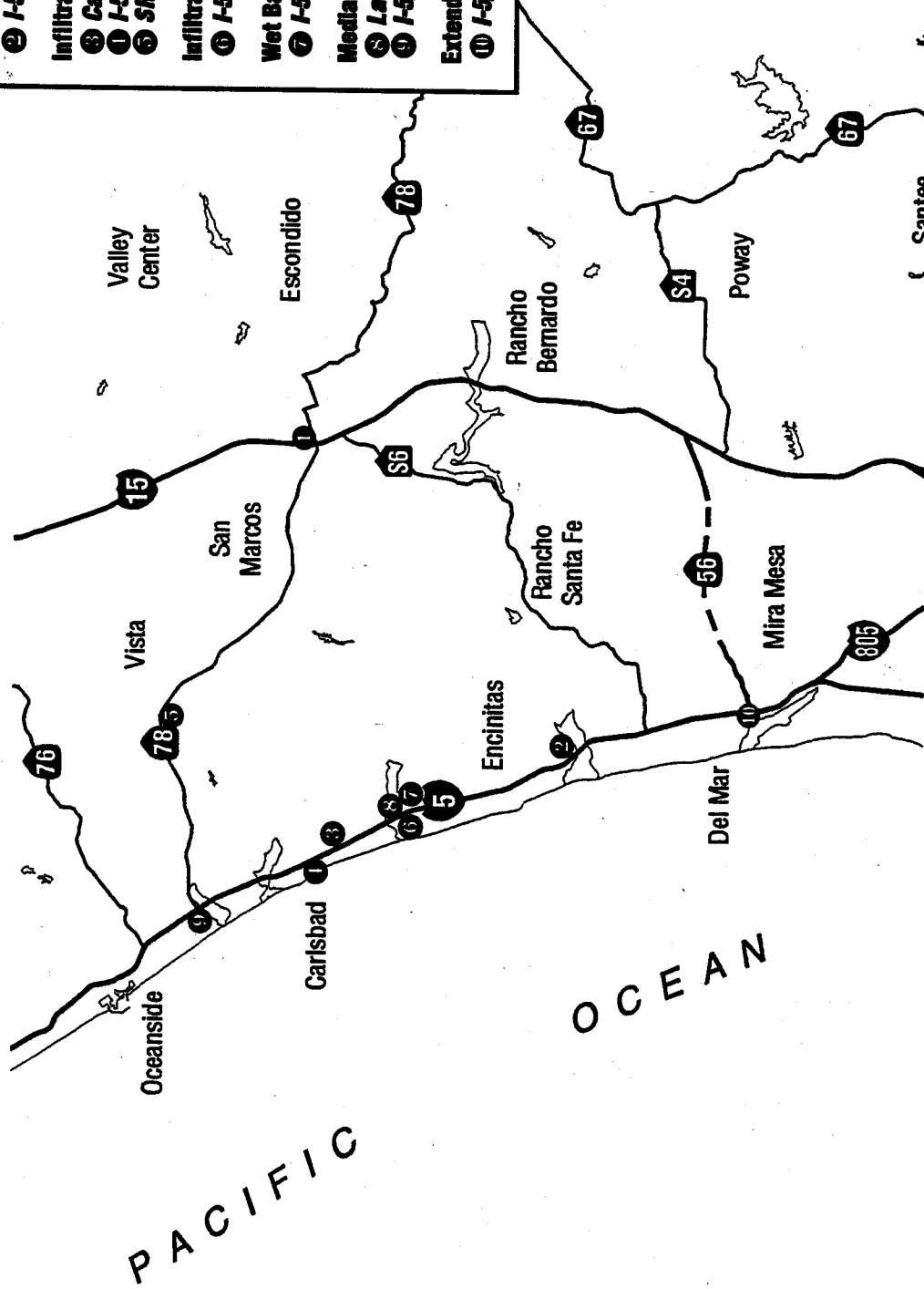
Not to Scale

FIGURE 1

Caltrans BMP Retrofit Pilot Program, LA & SD Counties - Biological Monitoring Report
Regional Location Map - District 7, Los Angeles

BASE MAP SOURCE: RBF & Associates, 4/99

- Extended Detention Basin:**
- ① SR-78/I-15
 - ② I-5/Manchester Avenue (east)
- Infiltration Trench/Biofilter (strip/swale):**
- ③ Carlsbad MS
 - ④ I-5 (south)/Palomar Airport Road
 - ⑤ SR-78 (east)/Melrose Drive Exit
- Infiltration Basin:**
- ⑥ I-5/La Costa Avenue (northwest)
- Wet Basin:**
- ⑦ I-5/La Costa Avenue (southeast)
- Media Filter:**
- ⑧ La Costa P&R
 - ⑨ I-5/SR-78 Interchange P&R
- Extended Detention Basin:**
- ⑩ I-5/SR-56 Interchange



1" = 5 Miles

FIGURE
2

Caltrans BMP Retrofit Pilot Program, LA & SD Counties - Biological Monitoring Report
Regional Location Map - District 11, San Diego

Monitoring Report • Caltrans BMP Retrofit Pilot Program

TABLE 1 (Continued)
BMP LOCATIONS, TYPE AND POTENTIAL BIOLOGICAL ISSUES

Location: BMP Type	Sensitive Species Activity/Type	Action	Gopher Mounds/ Action*	Ground Squirrel Holes/ Action*	Nesting Birds	Standing Water	Species Observed
I-5/La Costa W; InfBa	No	N/A	No	No	No	No	black phoebe
I-5/La Costa SE; WetBa	No	N/A	No	No	No	Yes	Mourning dove, mallard, black phoebe, killdeer, house finch, gadwall, common yellow-throat, raccoon
SR-78/Melrose; BiofSw	No	N/A	Yes/watch	No	No	No	None
I-5/Palomar Airport; BiofSw	No	N/A	Yes/trap	Yes/bait	No	No	mourning dove
I-5/LaCosta P&R; MedFi	No	N/A	No	No	No	No	scrub jay
I-5/SR-78 P&R; MedFi	No	N/A	No	No	No	No	None

InfBa - Infiltration Basin
 ExtDB - Extended Detention Basin
 BiofSw - Biofiltration Swale
 BiofSt - Biofiltration Strip
 WetBa - Wet Basin
 MedFi - Media Filter

* Action needed to protect against potential sensitive species occupation – does not account for any actions required to protect site from herbivory, erosion, or other problems caused by fossorial mammals.

DISTRICT 7 (LOS ANGELES) BMP SITES

605/91 Interchange Extended Detention Basin

Gopher burrows were evident adjacent to the BMP. No ground squirrel hole were evident. No sensitive species were present or expected.

There are no recommendations at this time.

605/91 Interchange Biofiltration Swale

Gopher burrows were abundant within the BMP. Additionally, an abundant amount of gopher activity was evident surrounding the BMP. No ground squirrel burrows were present. No sensitive species were present or expected.

The only recommendation at this time is to trap the gophers so that the amount of soil disturbance caused by them does not compromise the target cover of salt grass.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

605/91 Interchange Biofiltration Strip

Gophers are beginning to invade the site, particularly at the recovery area. The grass continues to look in good shape with the exception of the newly planted area. No ground squirrels were present. No sensitive species were detected or expected.

It is recommended that the area is watched for increased gopher activity.

605/91 Interchange Infiltration Basin

There is abundant gopher activity present within the basin. Ground squirrel or pocket gopher burrows are evident around the perimeter of the BMP adjacent to the access road. No sensitive species were detected or expected.

It is recommended that the surrounding pocket gopher or ground squirrel activity be closely watched and burrows closed as encountered. If the problem gets worse, then control methods will be recommended.

5/605 Interchange Extended Detention Basin

Gopher activity was evident around the BMP on slopes. No ground squirrels were detected. No sensitive species were detected or expected.

There are no recommendations at this time.

5/605 Interchange Biofiltration Swale

No ground squirrel burrows were present. Pocket gopher burrows were lightly distributed throughout the BMP. No sensitive species were detected or expected. Standing water was present at the inlet; however, there were no biological issues associated with this.

Trapping may be required in order to maintain the target % coverage of salt grass.

Cerritos Maintenance Station/91 Biofiltration Swale

There still are lots of gopher mounds distributed throughout the BMP. No ground squirrel burrows were detected. No sensitive species were detected or expected.

Gopher trapping should occur/continue to minimize the amount of herbivory on the grass filter and to maintain the target coverage of salt grass. However, gopher mounds are not expected to create sensitive species habitat.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

DISTRICT 11 (SAN DIEGO) BMP SITES

5/56 Interchange Extended Detention Basin

No gopher mounds or ground squirrel burrows were detected. Shrubs at the south end have been trimmed. No sensitive species were detected or expected.

There are no recommendations at this time.

5/Manchester Avenue Extended Detention Basin

No ground squirrel or pocket gopher activity was evident. Standing water was present in the bottom of the basin; however, there were no biological issues associated with this. There are no sensitive species issues at this time.

There are no recommendations at this time.

5/La Costa Avenue Wet Basin

There were no gopher mounds or ground squirrel burrows in or in the vicinity of the BMP. Standing water was present at the margin between the basin and the overflow channel; however, there were no biological issues associated with this. There are no sensitive species issues at this time. Many wetland wildlife species are now utilizing the site. Emergent wetland vegetation now approximates 15+% of the total basin surface area.

There are no recommendations at this time.

La Costa Avenue Media Filter

There are no issues at the media filter at this time. There are no recommendations.

5/La Costa Avenue Infiltration Basin

There were no gopher mounds or ground squirrel burrows detected. No sensitive species were detected or expected at this time.

There are no recommendations at this time.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

5/Palomar Airport Road Biofiltration Swale

Gopher mounds are distributed along the western edge of the BMP. Ground squirrel burrows were present adjacent to the right-of-way fence. The filter grass is lush. There were no sensitive species issues.

It is recommended that trapping occur for gophers and baiting for ground squirrels.

78/Melrose Drive Biofiltration Swale

A few gopher mounds were detected primarily along the north bank. The filter grass was thick but appeared to have stopped growing for the year. No ground squirrel burrows were present. No sensitive species were present.

It is recommended that the gophers are watched at this time.

78/15 Extended Detention Basin

Ground squirrel and/or pocket gopher activity still is increasing adjacent to the blacktop access road which leads into the basin. Abundant ground squirrel and gopher activity is present adjacent to the BMP on slopes. No sensitive species were detected.

It is recommended that gophers are trapped and bait stations applied.

5/78 Media Filter

There were no issues at the media filter. There are no recommendations.

COMMENTS

Gopher and ground squirrel activity is still more prevalent in District 7; however, the District 11 – 5/Palomar, 78/Melrose, and 78/15 BMPs are still a concern. Gopher activity should not create habitat for sensitive species; however, on the District 7 sites, they are having a deleterious effect on the grass BMP. If they continue, they may reduce the cover of the salt grass to a level below that which is recommended. Trapping should occur on the Cerritos maintenance station biofiltration swale, 5/605 biofiltration swale, 605/91 biofiltration swale, 15/78 extended detention basin, and 5/Palomar Airport Road biofiltration swale.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

California ground squirrel burrows should be collapsed as they are found.

Presently, nesting birds will not constrain maintenance activities, nor will sensitive species.

LITERATURE CITED

Robert Bein, William Frost and Associates. 1999. Project Information for Selected Best Management Practice (BMP) Sites in Caltrans Districts 7 and 11. 27pp.

CALTRANS BMP Retrofit Pilot Program Districts 7 and 11

BIOLOGICAL MONITORING REPORT for January 2000

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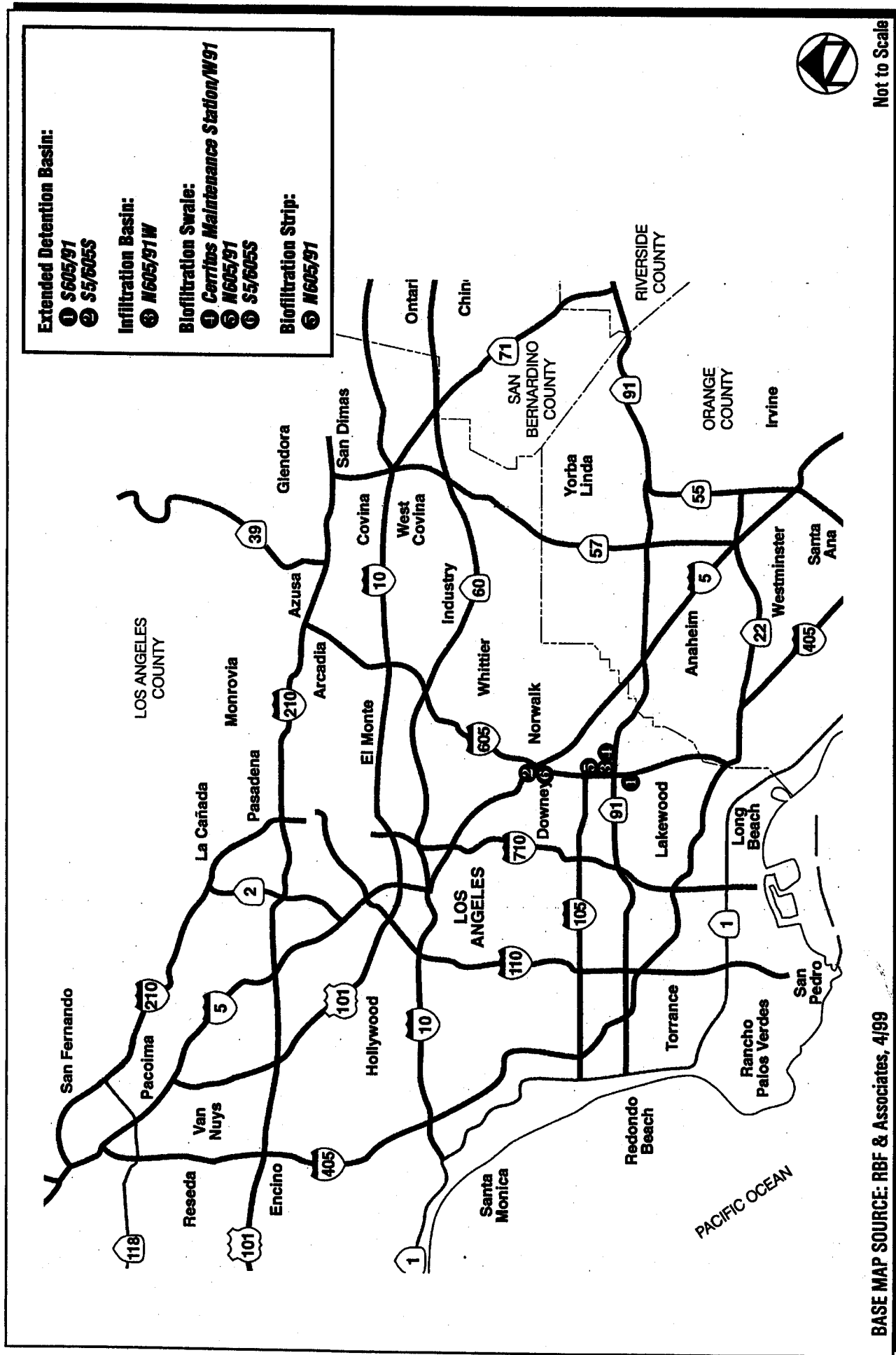
This report is intended to describe biological monitoring efforts in regards to the California Department of Transportation (Caltrans) Best Management Practices facilities (BMP) pilot study occurring in Districts 7 and 11 (Los Angeles and San Diego respectively). The pilot study, BMP locations, and BMP descriptions have been well described previously by Robert Bein, William Frost and Associates (RBF 1999).

Seven District 7 BMP sites (*Figure 1*) and nine District 11 BMP sites (*Figure 2*) are monitored monthly by Dudek and Associates, Inc. (DUDEK). DUDEK previously determined that the 16 sites may have the potential to become significant from a wildlife perspective. DUDEK Wildlife biologist Brock A. Ortega visited the District 11 BMPs and District 7 BMP's on 6 and 7 January 2000, respectively. Survey conditions on both days were appropriate for detection of wildlife (i.e., clear skies, cool temperatures, light breezes).

Table 1 presents a synopsis of potential issues related to each BMP site. A discussion of each BMP site follows the table.

TABLE 1
BMP LOCATIONS, TYPE, POTENTIAL BIOLOGICAL ISSUES
AND SUMMARY OF FINDINGS

Location; BMP Type	Sensitive Species Activity/Type	Action	Gopher Mounds/ Action*	Ground Squirrel Holes/ Action*	Nesting Birds	Standing Water	Species Observed
I-605/SR-91; InfBa	No	N/A	Yes/None	No	No	No	killdeer, rock dove
I-605/SR-91; InfBa	No	N/A	Yes/None	No	No	No	None
I-5/I-605; ExtDB	No	N/A	Yes/None	No	No	No	None
I-605/SR-91; BiofSt	No	N/A	Yes/trap	No	No	No	None
Cerritos MS; BiofSw	No	N/A	Yes/trap	?/watch	No	No	None
I-5/I-605; BiofSw	No	N/A	Yes/trap	No	No	Yes	None
I-605/SR-91; BiofSw	No	N/A	Yes/trap	No	No	No	rock dove
I-5/Manchester; ExtDB	No	N/A	No	No	No	No	killdeer
I-5/SR-56; ExtDB	No	N/A	No	No	No	Yes	black phoebe, western meadow lark, house finch, red-wing black bird; Bewick's wren, common yellow-throat
I-15/SR-78; ExtDB	No	N/A	Yes/trap	No	No	No	None



Monitoring Report • Caltrans BMP Retrofit Pilot Program

TABLE 1 (Continued)
BMP LOCATIONS, TYPE AND POTENTIAL BIOLOGICAL ISSUES

Location; BMP Type	Sensitive Species Activity/Type	Action	Gopher Mounds/ Action*	Ground Squirrel Holes/ Action*	Nesting Birds	Standing Water	Species Observed
I-5/La Costa W; InfBa	No	N/A	No	No	No	No	black phoebe
I-5/La Costa SE; WetBa	No	N/A	No	No	No	No	Mourning dove, mallard, black phoebe, killdeer, house finch, coyote, gadwall, common yellow-throat, blue-gray gnatcatcher, raccoon, song sparrow
SR-78/Melrose; BiofSw	No	N/A	Yes/trap	No	No	No	None
I-5/Palomar Airport; BiofSw	No	N/A	Yes/trap	Yes/bait	No	No	None
I-5/LaCosta P&R; MedFi	No	N/A	No	No	No	No	None
I-5/SR-78 P&R; MedFi	No	N/A	No	No	No	No	None

InfBa - Infiltration Basin
 ExtDB - Extended Detention Basin
 BiofSw - Biofiltration Swale
 BiofSt - Biofiltration Strip
 WetBa - Wet Basin
 MedFi - Media Filter

* Action needed to protect against potential sensitive species occupation – does not account for any actions required to protect site from herbivory, erosion, or other problems caused by fossorial mammals.

DISTRICT 7 (LOS ANGELES) BMP SITES

605/91 Interchange Extended Detention Basin

Gopher burrows were evident adjacent to the BMP. No ground squirrel hole were evident. No sensitive species were present or expected.

There are no recommendations at this time.

605/91 Interchange Biofiltration Swale

Gopher burrows were abundant within the BMP. Additionally, an abundant amount of gopher activity was evident surrounding the BMP. No ground squirrel burrows were present. No sensitive species were present or expected.

The only recommendation at this time is to trap the gophers so that the amount of soil disturbance caused by them does not compromise the target cover of salt grass.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

605/91 Interchange Biofiltration Strip

Gophers continue to invade site, causing lots of damage, particularly at the recovery area. The grass continues to look in good shape with the exception of the newly planted area. No ground squirrels were present. No sensitive species were detected or expected.

It is recommended that trapping be implemented for gophers so that the amount of soil disturbance caused by them does not compromise the target coverage of salt grass.

605/91 Interchange Infiltration Basin

There is abundant gopher activity present within the basin. An increase in ground squirrel or pocket gopher burrows are evident around the perimeter of the BMP adjacent to the access road. No sensitive species were detected or expected.

There are no maintenance recommendations at this time. However, it is recommended that the surrounding pocket gopher or ground squirrel activity be closely watched and burrows closed as encountered. If the problem gets worse, then control methods will be recommended.

5/605 Interchange Extended Detention Basin

Gopher activity was evident around the BMP on slopes. No ground squirrels were detected. No sensitive species were detected or expected.

There are no recommendations at this time.

5/605 Interchange Biofiltration Swale

No ground squirrel burrows were present. Pocket gopher burrows were lightly distributed throughout the BMP. No sensitive species were detected or expected. Standing water was present at the inlet; however, there were no biological issues associated with this.

Trapping may be required in order to maintain the target % coverage of salt grass.

Cerritos Maintenance Station/91 Biofiltration Swale

There still are lots of gopher mounds distributed throughout the BMP. Possible ground squirrel burrows also occur within the BMP. No sensitive species were detected or expected.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

Gopher trapping should occur/continue to minimize the amount of herbivory on the grass filter and to maintain the target coverage of salt grass. However, gopher mounds are not expected to create sensitive species habitat.

DISTRICT 11 (SAN DIEGO) BMP SITES

5/56 Interchange Extended Detention Basin

No gopher mounds or ground squirrel burrows were detected. Shrubs at the south end have been trimmed. No sensitive species were detected or expected.

There are no recommendations at this time.

5/Manchester Avenue Extended Detention Basin

No ground squirrel or pocket gopher activity was evident. There are no sensitive species issues at this time.

There are no recommendations at this time.

5/La Costa Avenue Wet Basin

There were no gopher mounds or ground squirrel burrows in or in the vicinity of the BMP. There are no sensitive species issues at this time. A visual survey for light-footed clapper rail was negative. Many wetland wildlife species are now utilizing the site. Emergent wetland vegetation now approximates 15% to 20% of the total basin surface area.

There are no recommendations at this time.

La Costa Avenue Media Filter

There are no issues at the media filter at this time. There are no recommendations.

5/La Costa Avenue Infiltration Basin

There were no gopher mounds or ground squirrel burrows detected. No sensitive species were detected or expected at this time.

Because the rainy season will soon be upon us, it is recommended that a net exclusion device is placed around the BMP so that potential fairy shrimp vectors (i.e., waterfowl) are excluded. This is recommended so that the BMP does not become a sink for federally-listed endangered species.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

5/Palomar Airport Road Biofiltration Swale

Gopher mounds are distributed along the western edge of the BMP. Ground squirrel burrows were present adjacent to the right-of-way fence. The filter grass is lush. There were no sensitive species issues.

It is recommended that trapping occur for gophers and baiting for ground squirrels.

78/Melrose Drive Biofiltration Swale

A few gopher mounds were detected primarily along the north bank. The filter grass was thick but appeared to have stopped growing for the year. No ground squirrel burrows were present. No sensitive species were present.

It is recommended that the gophers are trapped.

78/15 Extended Detention Basin

Ground squirrel and/or pocket gopher activity still is increasing adjacent to the blacktop access road which leads into the basin. Abundant ground squirrel and gopher activity is present adjacent to the BMP on slopes. No sensitive species were detected.

It is recommended that gophers are trapped and bait stations applied.

5/78 Media Filter

There were no issues at the media filter. There are no recommendations.

COMMENTS

Gopher and ground squirrel activity is still more prevalent in District 7; however, the District 11 – 5/Palomar, 78/Melrose, and 78/15 BMPs are still a concern. Gopher activity should not create habitat for sensitive species; however, on the District 7 sites, they are having a deleterious effect on the grass BMP. If they continue, they may reduce the cover of the salt grass to a level below that which is recommended. Trapping should occur on the 605/91 biofiltration strip, Cerritos maintenance station biofiltration swale, 5/605 biofiltration swale, 605/91 biofiltration swale, 15/78 extended detention basin, 78/Melrose biofiltration swale, and 5/Palomar Airport Road biofiltration swale.

Monitoring Report • Caltrans BMP Retrofit Pilot Program

California ground squirrel burrows should be collapsed as they are found and persistent or increasing populations at the 5/Palomar Airport Road biofiltration swale should be poisoned via bait stations.

Presently, nesting birds will not constrain maintenance activities, nor will sensitive species.

Finally, it is recommended that a net exclusion device is employed around the La Costa infiltration basin so that the basin does not become a fairy shrimp sink.

LITERATURE CITED

Robert Bein, William Frost and Associates. 1999. Project Information for Selected Best Management Practice (BMP) Sites in Caltrans Districts 7 and 11. 27pp.

APPENDIX F
USFWS LETTER ON WET BASIN MONITORING



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Carlsbad Fish and Wildlife Office
2730 Loker Avenue West
Carlsbad, California 92008



JAN 06 2000

J. Steven Borroum
Department of Transportation
1120 North Street
P.O. Box 942874
Sacramento, CA 94274-0001

Re: Caltrans Best Management Practices Pilot Study - Proposed Focus Surveys for Light-footed Clapper Rail at the La Costa Wet Basin, San Diego County, California

Dear Mr. Borroum:

This is in response to your letter, dated December 10, 1999, regarding proposed focus surveys for the light-footed clapper rail (*Rallus longirostris levipes*) at the project site referenced above. We appreciate your concern for the light-footed clapper rail and would like to take this opportunity to offer our comments and recommendations regarding the proposed survey methods.

Batiquitos Lagoon is regularly surveyed by Dick Zembal, of the Service. We believe that a small but established breeding presence exists in Batiquitos Lagoon. This distribution will likely expand as cordgrass becomes established in currently unvegetated areas. Although a visual survey of the La Costa Wet Basin would be useful, we believe that the use of a taped clapper rail call would be potentially harmful given the existing land use (e.g., La Costa Avenue) between the wet basin and known clapper rail locations.

The light-footed clapper rail is a territorial species that relies heavily on vocalizations (e.g., declaring its territory, finding a mate). The use of taped calls can be detrimental if not implemented properly or in the proper locations. For example, regularly playing a light-footed clapper rail tape across La Costa Avenue from Batiquitos Lagoon could attract a wandering male to the area, greatly increasing its chance of being injured or killed trying to cross the busy roadway. Additionally, playing a taped call for the light-footed clapper rail is considered "harassment" and is a violation of the prohibitions of section 9 of the Endangered Species Act of 1973 (Act), as amended. Therefore, the biologist conducting such survey methods is required to be properly permitted under section 10(a)(1)(A) of the Act.

Mr. Borroum

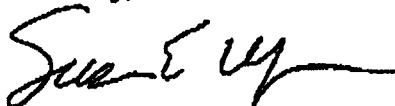
2

Since this area is being regularly survey by permitted biologists, we recommend that Caltrans conduct only visual surveys of the La Costa Wet Basin and coordinates regularly with the Service for the most current survey results from Batiquitos Lagoon. If maintenance activities are required within the wet basin, coordination with the Service should occur as early as possible in order to assess the status of the light-footed clapper rail within the area of the La Costa Wet Basin.

We are very interested in the how the Best Management Practices test facilities are working and would appreciate receiving annual reports or other available documentation. This information can be sent to the attention of Mr. Jack Fancher of this office.

Thank you for the opportunity to review and comment on the proposed light-footed clapper rail survey methodology. If you have any questions regarding this letter, please contact Ms. Stefanie Barren, of this office, at (760) 431-9440.

Sincerely,



for Nancy Gilbert
Assistant Field Supervisor

DEPARTMENT OF TRANSPORTATION**ENVIRONMENTAL PROGRAM - MS-27**

1120 N STREET

P.O. BOX 942874

SACRAMENTO, CA 94274-0001

PHONE (916) 653-7507

FAX (916) 653-6366



February 23, 2000

Ms. Nancy Gilbert
U.S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, California 92008

**Subject: Caltrans Best Management Practices Pilot Study – La Costa Wet Basin,
County of San Diego, California**

Dear Ms. Gilbert:

Thank you for reviewing and issuing comment on, our initial letter dated 10 December 1999. Briefly, our initial letter outlined details regarding the Caltrans BMP project and our proposed survey methodology for the federally-listed light-footed clapper rail (*Rallus longirostris levipes*) at the La Costa Wet Basin.

We recognize your concerns that utilizing taped clapper rail playback may place existing members of the Batiquitos Lagoon population at unnecessary risk of injury or death by drawing them to the La Costa Wet Basin over La Costa Boulevard. We also recognize that utilizing tape playback methodologies would require a 10(a)(1)(A) permit pursuant to the Endangered Species Act. Therefore, as suggested, we will continue to only conduct visual surveys of the project site for the clapper rail. Additionally, we will coordinate with Mr. Dick Zembal with regard to the current status of the Batiquitos Lagoon population. We are also available to meet to discuss the operation and maintenance of the basin.

The revised survey methodology includes the following:

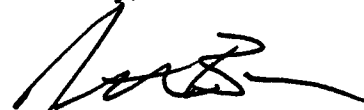
- Surveys should be conducted by a qualified biologist familiar with the audible and visual characteristics of the clapper rail.
- Surveys will be conducted approximately every 14 days between March 1 and July 31 and once a month between August 1 and February 28.
- Surveys will be conducted by visual means only.

- Surveys should be conducted between one hour before sunrise to two hours after sunrise or between two hours before sunset to one hour after sunset.
- Surveys should not be conducted during periods of excessive or abnormal cold, heat, wind, rain, or other inclement weather that may reduce the likelihood of detection.
- Surveys should last at least one half-hour long.
- Upon entering the site, the Surveyor should go to a good observation point and stop, watch, and listen for clapper rail, for a period of fifteen minutes. The Surveyor should then proceed slowly around the basin, to the opposite side. At the opposite side of the basin, the surveyor should again stop, watch, and listen for clapper rail, for a period of fifteen minutes. Finally, the surveyor should continue around to the starting point in a slow manner.

The operation and maintenance of the Wet Basin is an on-going process in accordance to the activities and schedule described in the Maintenance Indicator Document (MID). We are preparing supplemental information for the element of the MID regarding vegetation inspection and removal. We expect to have the supplemental information by mid-March. We would appreciate your review of this information in advance of setting a meeting. Upon reviewing the MID for the Wet Basin, if you have further concerns, please contact us immediately. Otherwise, if it is determined, through monitoring activities, that a clapper rail is utilizing the Wet Basin, you will be contacted immediately.

Please contact me at (916) 653 - 7396 if you have any questions, comments, or suggestions regarding this letter.

Sincerely,



J. STEVEN BORROUM, Chief
Environmental Engineering

Attachment: MIDv12 - Wet Basin

cc: Stefanie Barrett – USFWS
Jack Fancher – USFWS
Cid Tesoro - Caltrans, District 11
Brian Currier, UCDavis
Robert Wu, Caltrans
Bill Whitenberg – RBF
Trevor Smith – RBF
Brock Ortega – DUDEK
Rick Graff - SDBayKeeper
Rich Horner - NRDC
Jeremy Johnstone - USEPA

CALTRANS BMP RETROFIT PILOT PROGRAM BMP MAINTENANCE INDICATORS (WET BASIN)

The following specific thresholds are for specified and implied criteria which "trigger" maintenance activities for specific BMPs. The maintenance activity shown is for those times when the field measurement exceeds the maintenance indicator. These thresholds do not preclude taking other actions needed to mitigate the given thresholds or taking actions needed to mitigate unanticipated problems. These indicators are not only for the BMP pilot program, but they are also considered representative of the long-term maintenance requirements for the BMPs.

This document covers routine maintenance. There may be occasions where emergencies arise, such as accidents, toxic spills, or other incidents, where critical response is needed. On those occurrences, Caltrans crews will respond to the emergency, on a priority basis and, if necessary, the BMP will be taken out of service until the BMP can be restored. The goal for such critical situations is to have the BMP back into service within 30 days.

The time period noted, for completion of any maintenance activity, is a goal that will depend on weather, access to the BMP, personnel and equipment availability.

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
24 hour draw down measured between the outlet structure and invert of the WQ orifice in the outlet structure..	Drawdown greater than 25 hours or water is flowing over weir.	Evaluate drain time from inlet and outlet flow data loggers or observe 25 hours after target storm. Observation of water flowing over spillway	After each target storm event	If >25-hours: Open gate to discharge water to permanent pool elevation, clear outlet of debris. Consult engineer if needed. If water is spilling over weir open canal gate until water level is at permanent pool	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<p>elevation.</p> <ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage. Where gophers are present, trap the gophers and level the mounds and firmly backfill the burrows to prevent seepage, erosion 	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<ul style="list-style-type: none"> and leakage. Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage. 	
Inspect for possible endangered species, threatened species and species of special concern within the BMP maintenance perimeter.	Evidence of emergence of woody vegetation, shrubs, dwarf plantain, or wetland vegetation, burrowing animal damage. Presence of logs, woodpiles, rocks,	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> Remove woody vegetation, shrubs, dwarf plantain, pickleweed and woody wetland vegetation³ above the maintenance road area within 10 	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	or large debris.			days. <ul style="list-style-type: none"> Remove debris, woodpiles etc. within 10 days. On Mar 1, deploy stakes with mylar strips and place scarecrow device around BMP. If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrows before sealing the hole. Remove floating debris and dead and floating vegetation mats within 10 days. Maintain wetland vegetation only between August and February 	
General Maintenance	Inlet structures, outlet	Visual observation	Monthly	Within 10 working	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Inspection	structures, side slopes or other features damaged, significant erosion, graffiti or vandalism, fence damage, etc.			days, take corrective action. Consult engineers is immediate solution is not evident.	
Inspect zone of periodic inundation vegetation	•Wetland plant density in the zone of periodic inundation is maintained at the "as constructed" density.	Visual observation/estimate	Annually, approx. May 1	By Nov 1 each year, restore to "as constructed" plant density	None
Inspect for sediment accumulation in forebay and main pond	More than 2 inches in the forebay and 4 inches in the main pond, or	Measure with appropriate device	Monthly	Remove and dispose of sediment. Target completion period within 30 days. If vegetation coverage drops below 30 percent during maintenance operation, replant vegetation on November 1 to restore to 30 percent coverage	La Costa site only
	Any parameter concentration (See Vol II) exceeds 50% of	Sample according to OMM plan Vol II and send samples to lab	May 1 each year	If sediment characterization exceeds maintenance	

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
	Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% TTLC, and the WET results exceed 50 % of the STLC value.			indicator, remove and dispose of sediment. Regrade. Revegetate, if vegetation coverage drops below 30 percent. Replant vegetation on November 1 to restore to 30 percent coverage	

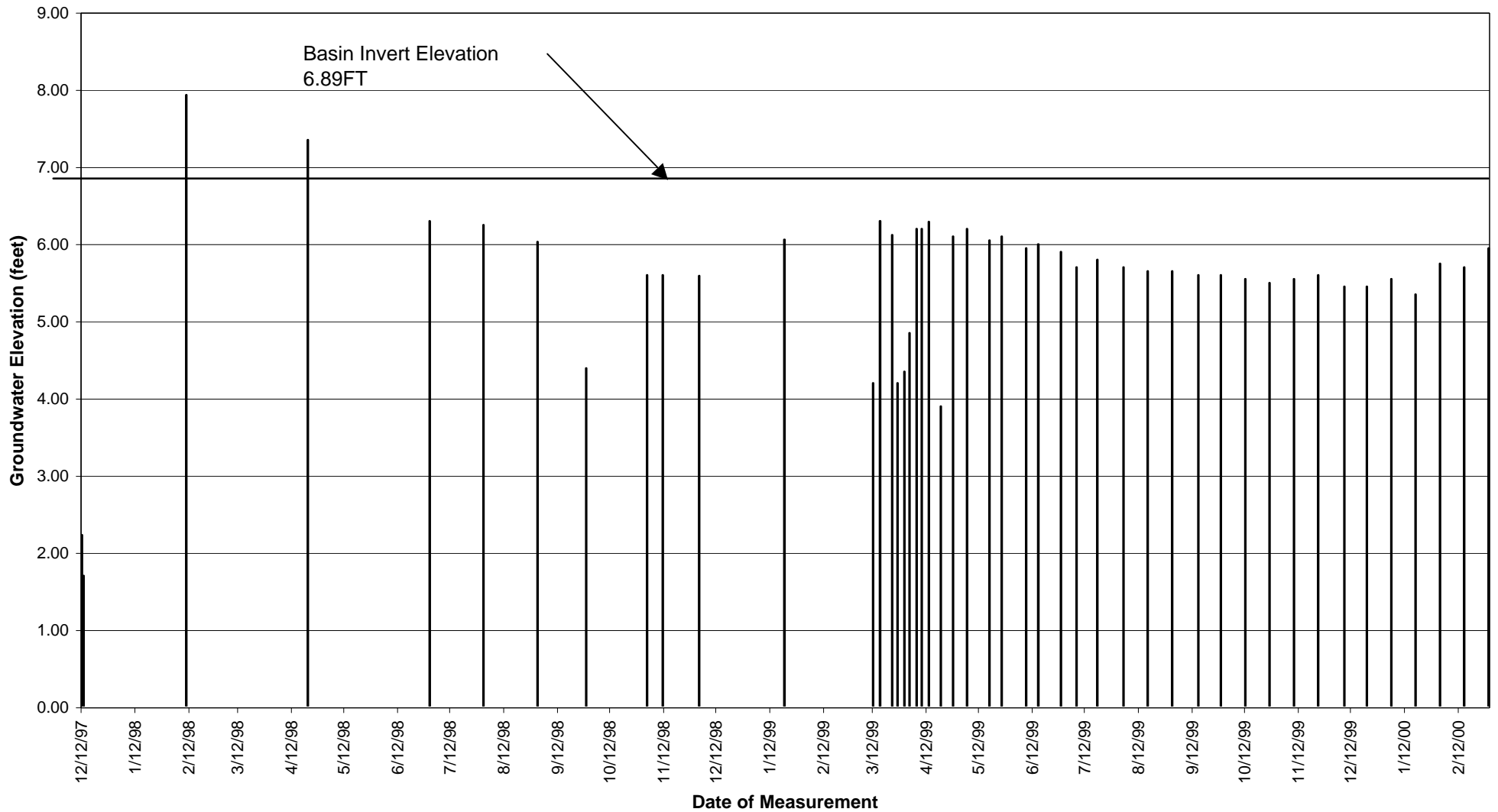
Notes for all BMPs:

1. Design storm event is a storm that is a one year 24 hour recurrence frequency.
2. A target storm event is a storm with a predicted greater than 0.25 inches of rainfall or 0.1 inches for drain inlet inserts. Storm events should be separated by at least 72 hours of dry weather from the previous storm event.
3. Woody wetland vegetation consists of: willows (*Salix spp*), mule fat (*baccharis salicifolia*), cottonwood (*populus fremontii*), western sycamore (*plantanus racemosa*) and emergent large stature monocots including the genera *Cyperus*, *Juncus*, *Scirpus*, and *Typha*)

This Maintenance Indicator Document has been developed using site-specific information gathered by specialists trained in the identification of threatened and endangered species and their habitat. Information contained in this document includes guidance for inspection for possible threatened and endangered species harborage. Further, some of the maintenance recommendations are based on the requirements of specific plant species used in this Pilot Program. The recommendations provided in this document must be reassessed with respect to species and plant materials if the guidance contained herein is to be used for a separate project in another area.

APPENDIX G
LA COSTA INFILTRATION BASIN GROUNDWATER LOG

Groundwater Level Monitoring at I-5/La Costa Infiltration Basin Site



**BMP RETROFIT PILOT PROGRAM
PS&E LOCATION 3
I-5/LA COSTA AVE INFILTRATION BASIN**

**TABLE 1
WATER SURFACE ELEVATION SUMMARY SHEET**

Date	Time	Field Reading		Pond Depth ⁺ (FT)	Groundwater Elev (FT) ⁺	Delta (FT)	By
		Headwall (FT)	Monitoring Well (FT)				
12/12/97	---	---	BORING WW-1	---	2.22	4.67	GDC
12/13/97	---	---	BORING WW-2	---	1.69	5.20	GDC
12/23/97	---	---	---	---	No groundwater encountered.	---	GDC
2/10/98	---	---	3.00	---	7.92	-1.03	GDC
4/21/98	---	---	5.85	---	7.34	-0.45	GDC
6/30/98	10:00am	---	6.90	---	6.29	0.60	KLI
7/31/98	4:15pm	---	6.95	---	6.24	0.65	KLI
8/31/98	11:57am	---	7.17	---	6.02	0.87	KLI
9/28/98	---	---	---	---	4.38	---	RBF
11/2/98	4:04pm	---	7.60	---	5.59	1.30	KLI
11/11/98	4:55pm	---	7.60	---	5.59	1.30	KLI
12/2/98	---	---	7.61	---	5.58	1.31	KLI
12/17/98	---	---	---	---	0.00	---	CT RE
1/20/99	7:05am	---	7.14	---	6.05	0.84	GDC
2/24/99	10:15am	2.08	---	---	---	---	GC
3/2/99	2:00pm	1.88	---	---	---	---	AW
3/9/99	11:00am	1.73	---	---	---	---	GC
3/12/99	1:00pm	1.86	9.00	1.45	4.19	2.70	AW
3/16/99	4:55pm	1.98	6.90	1.57	6.29	0.60	AW
3/23/99	10:00am	1.76	7.08	1.35	6.11	0.78	AW
3/26/99	10:20am	2.48	9.00	2.07	4.19	2.70	AW
3/30/99	9:05am	2.28	8.85	1.87	4.34	2.55	AW
4/2/99	8:15am	2.89	8.35	2.48	4.84	2.05	AW
4/6/99	2:00pm	2.69	7.00	2.28	6.19	0.70	AW
4/9/99	10:00am	2.67	7.00	2.26	6.19	0.70	AW
4/13/99	10:00am	2.89	6.91	2.48	6.28	0.61	AW
4/20/99	9:50am	2.52	9.30	2.11	3.89	3.00	AW
4/27/99	2:25pm	2.50	7.10	2.09	6.09	0.80	AW
5/5/99	1:10pm	2.06	7.00	1.65	6.19	0.70	AW
5/18/99	5:55pm	1.66	7.15	1.25	6.04	0.85	AW

**BMP RETROFIT PILOT PROGRAM
PS&E LOCATION 3
I-5/LA COSTA AVE INFILTRATION BASIN**

**TABLE 1
WATER SURFACE ELEVATION SUMMARY SHEET**

Date	Time	Field Reading		Pond Depth ⁺ (FT)	Groundwater Elev (FT) ⁺	Delta (FT)	By
		Headwall (FT)	Monitoring Well (FT)				
5/25/99	5:40pm	1.50	7.10	1.09	6.09	0.80	AW
6/8/99	5:40pm	1.30	7.25	0.89	5.94	0.95	AW
6/15/99	1:45pm	1.10	7.20	0.69	5.99	0.90	AW
6/28/99	1:50pm	0.82	7.30	0.41	5.89	1.00	AW
7/7/99	12:45pm	0.62	7.50	0.21	5.69	1.20	AW
7/19/99	10:30am	0.43	7.40	0.02	5.79	1.10	AW
8/3/99	11:45am	0.22	7.50	-0.19	5.69	1.20	AW
8/17/99	10:50am	0.12	7.55	-0.29	5.64	1.25	AW
8/31/99	9:50am	0.12	7.55	-0.29	5.64	1.25	AW
9/15/99	11:45am	-0.26	7.60	-0.67	5.59	1.30	AW
9/28/99	11:55am	0.08	7.60	-0.33	5.59	1.30	AW
10/12/99	10:05am	0.08	7.65	-0.33	5.54	1.35	AW
10/26/99	3:00pm	0.08	7.70	-0.33	5.49	1.40	AW
11/9/99	2:35pm	0.08	7.65	-0.33	5.54	1.35	AW
11/23/99	4:05pm	No standing water.	7.60	No standing water.	5.59	1.30	FP
12/8/99	10:15am	No standing water.	7.75	No standing water.	5.44	1.45	AW
12/21/99	3:30pm	No standing water.	7.75	No standing water.	5.44	1.45	AW
1/4/00	12:20pm	No standing water.	7.65	No standing water.	5.54	1.35	AW

**BMP RETROFIT PILOT PROGRAM
PS&E LOCATION 3
I-5/LA COSTA AVE INFILTRATION BASIN**

**TABLE 1
WATER SURFACE ELEVATION SUMMARY SHEET**

Date	Time	Field Reading		Pond Depth [*] (FT)	Groundwater Elev (FT) [*]	Delta (FT)	By
		Headwall (FT)	Monitoring Well (FT)				
1/18/00	8:50am	No standing water.	7.85	No standing water.	5.34	1.55	AW
2/1/00	10:15am	Small Pools.	7.45	No standing water.	5.74	1.15	CW
2/15/00	4:45pm	1.60	7.50	1.19	5.69	1.20	MZ
2/29/00	12:30pm	2.90	7.25	2.49	5.94	0.95	MZ

*

Temporary Well: Well Cover elevation 10.99 ft (3.35m). Well rim elevation 10.92 ft.
WSE at monitoring well = Well cover elevation (FT) - Monitoring Well Reading (FT)

*

Permanent Well: Monitoring well notch at elevation 13.186 ft (4.02m)
WSE at monitoring well = Notch elevation (FT) - Monitoring Well Reading (FT)
Monitoring Well reading = Distance to groundwater surface

*

Pond Depth = Headwall Field Reading (FT) - Pipe Invert Location on the Headwall Gauge (FT)
Pipe Invert Location on the Headwall Gauge (FT) = 0.41 ft
Note: Negative Pond Depths indicate ponded water is below invert.
This is due to scour and settlement of the invert material.

Delta = Basin Invert - Groundwater elevation
Basin Invert = 6.89 FT (2.1m)

AW- RBF

FP- RBF

GC- RBF

GDC-Group Delta Consultants (Formerly LKR- The LKR Group, Consulting Geotechnical Engineers)

KLI- Kinnetic Laboratories, Inc.

CT RE- Caltrans Resident Engineer

APPENDIX H

PROJECT CALENDAR

December 1999

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday																																																																																																		
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January 2000

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APPENDIX I
MAINTENANCE INDICATOR DOCUMENT

CALTRANS
BMP RETROFIT PILOT PROGRAM



MAINTENANCE INDICATOR
DOCUMENT

January 2000

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CALTRANS BMP RETROFIT PILOT PROGRAM BMP MAINTENANCE INDICATORS

The following specific thresholds are for specified and implied criteria which “trigger” maintenance activities for specific BMPs. The maintenance activity shown is for those times when the field measurement exceeds the maintenance indicator. These thresholds do not preclude taking other actions needed to mitigate the given thresholds or taking actions needed to mitigate unanticipated problems. These indicators are not only for the BMP pilot program, but they are also considered representative of the long-term maintenance requirements for the BMPs.

This document covers routine maintenance. There may be occasions where emergencies arise, such as accidents, toxic spills, or other incidents, where critical response is needed. On those occurrences, Caltrans crews will respond to the emergency, on a priority basis and, if necessary, the BMP will be taken out of service until the BMP can be restored. The goal for such critical situations is to have the BMP back into service within 30 days.

The time period noted, for completion of any maintenance activity, is a goal that will depend on weather, access to the BMP, personnel and equipment availability.

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Uniform sheet flow over length of strip and across swale invert	Evidence of significant channeling or ponding	Visual inspection of erosion or major portions of flow discharge across strip/swale	Monthly, during target storms in the wet season	Correct channelized or ponded areas using additional fill and vegetation and/or by removing accumulated sediment. Target completion time is within 10 days.	None
Height of vegetation	Average plant height exceeds 10 inches	Visual inspection of vegetation throughout strip/swale	In October , and January and monthly during dry season	Cut plants to a average height of 6 inches and remove trimmings. Target completion within 10 days.	Palomar Airport Road Site: maximum average height is 13 inches; trim to 9 inches
Assess adequate vegetative cover	Less than 90 percent coverage in strip invert/swale or less than 70 percent on swale side slope	Visual inspection of strip/swale. Prepare a site schematic to record location and distribution of barren or browning spots to be restored. File the schematic for assessment of persistent problems.	Assess quantity needed in May each year	Re-sod barren spots during October/ November. Wet soil before and after sod is placed. Scarify area to be restored, to a depth of 2-inches. Restore side slope coverage with hydroseed mixture.	Keep a reserve of approximately 10 percent of sodded surface area in saltgrass flats. Use mature flats to restore coverage. Order replacement material in May for delivery in September. Use original design erosion control seed mix on side slopes.

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				Irrigate same as saltgrass	
Residence time is less than design criteria	Residence time is less than design criteria	Measure mean residence times in swale using protocol in OMM plan. Calculate residence time for design storm.	Once per year during target storm	Assess the cause of the problem. As soon as weather and moisture conditions allow, take corrective action. If sediment is the cause, in September, remove and dispose of accumulated sediment. Regrade to restore flow gradient. Resod by November 1	Swales only Cerritos MS – 4 min 605/91 – 9 min 5/605 – 7 min 605/Carson – 9 min Palomar – 14 min Melrose – 15 min
Inspect for debris accumulation	Vegetative debris, debris or litter present	Visual observation	Monthly	Remove litter, vegetative debris, and debris. Target completion period within 10 days.	None
Inspect for accumulated sediment	Sediment at or near plant height, channeling of flow, inhibited flow due to change in slope	Visual observation	Monthly during wet season	Remove sediment. If flow is channeled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment, conduct	None

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				sediment characterization according to OMM Plan Vol II, dispose of sediment, and replant. Regrade to design specification and replant swale/strip with sod. If regrading is necessary, the process should start near May 1. Resod strip/swale in Nov. Target completion period within 10 days.	
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present 	None

BIOFILTER – STRIPS and SWALES
Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<p>(a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage.</p> <ul style="list-style-type: none"> • Where gophers are present, trap the gophers and level the mounds and firmly backfill the burrows to prevent seepage, erosion and leakage. • Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage • If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time 	

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage.	
Inspect for possible endangered species, threatened species and species of special concern within the BMP maintenance perimeter	Evidence of ponding, emergence of wetland or woody vegetation, shrubs, dwarf plantain, or burrowing animal damage. Presence of logs, woodpiles rocks, or large debris.	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> • Remove woody vegetation, shrubs, dwarf plantain, pickleweed, woody wetland vegetation³, and large debris within strip/swale within 10 days. • Correct ponded areas using sand fill within 3 days. • If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrow before sealing the hole. 	Vulnerable sites are: SR-78/Melrose I-5/Palomar Airport Rd

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<ul style="list-style-type: none"> At vulnerable sites, remove debris, woodpiles etc. within 10 days. 	
Inspect for standing water	Water accumulation in spreader ditch or any structure	Standing water in spreader ditch or any structure	Annually, May 1	Where gravity draining is possible, drain the standing water	None
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees, woody vegetation or weeds, fence damage, etc.	Visual observation	Monthly	Take action as needed to correct problems. Target completion period within 30 days.	Remove any trees, woody vegetation, or weeds taller than 12-inches.

DRAIN INLET INSERTS – STREAM GUARD

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Sediment removal	Sediment more than 6- inches	Visual inspection of sediment collected within insert	<ul style="list-style-type: none"> • Before each target storm event • Weekly during extended wet periods • Monthly during periods of dry weather 	Replace insert. Target completion period within 10 days.	None
Inspect for debris/trash	Sufficient debris/trash that could interfere with proper functioning of insert	Visual observation	<ul style="list-style-type: none"> • Before and once during each target storm event • Weekly during extended wet periods 	Remove and dispose of debris/trash. Target completion period within 1 day.	None
Oil and grease removal	Evidence of oily sheen in insert or downstream monitoring vault	Visual observation	During each target storm event and monthly during the dry season	Within 10 working days, replace oil absorbent polymer	None
Inspection for structural integrity	Improper installation, rips, tears, or other loss of structural integrity	Visual observation	Monthly	Replace insert or immediately consult with design engineer to develop a course of action, effect repairs within 10 working days	None

DRAIN INLET INSERTS – STREAM GUARD

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Annual renewal of medium	End of wet season, April 30	None	Annually	Remove media and analyze for parameters shown in OMM Plans. Replace media before Oct 1	None

DRAIN INLET INSERTS – FOSSIL FILTER

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Inspect for debris/trash	Sufficient debris/trash that could interfere with proper functioning of insert	Visual observation	<ul style="list-style-type: none"> • Before and once during each target storm event • Weekly during extended wet periods • Monthly during the dry season 	Remove and dispose of debris/trash. Target completion period within 1 day.	None
Oil and grease removal	Absorbent granules dark gray, or darker, or unit clogged with sediment.	Visual observation	<ul style="list-style-type: none"> • At the end of each target storm event • Weekly during extended wet periods • Monthly during the dry season 	Replace Fossil Filter™ trough within 10 working days.	None
Inspection for structural integrity	Broken or otherwise damaged insert	Visual observation	Monthly	Replace insert or immediately consult design engineer to develop course of action, effect repairs within 10 working days	None
Annual renewal of medium	End of wet season, April 30	None	Annually	Remove media and analyze for parameters shown in OMM Plans. Replace media before Oct 1	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Drain time is 72 hours for design volume	Less than 48 hours or more than 72 hours for full basin	Determine drain time based on effluent flow meter activity or visual observation	Immediately after each target storm	<ul style="list-style-type: none"> If time too long, open gate to discharge remaining volume, within 1 day. Per direction from design engineer, modify holes on standpipe after basin drains, within 30 days Remove and dispose of debris/trash from outlet/outlet screen, within 10 days. 	<ul style="list-style-type: none"> Does not apply to District 7 Extended detention Basins Clean rip-rap and standpipes in District 7
Basin side slope planted for erosion protection and planted invert	Average plant height greater than 18-inches	Visual observation and random measurements through out the side slope area	Monthly	Cut vegetation to an average height of 12-inches and remove trimmings. May cut to 8 inches after July 1. Target completion period within 30 days Do not cut more than four times per year,	None
Inspect for adequate	Less than 70 percent	Visual observation	October each year	Hydroseed barren	

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
vegetative cover	coverage on invert and side slopes			spots by Nov 1, scarify surface if needed.	
Inspect for possible vector harborage	Standing water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment	None
Inspection for trash and debris at inlet and outlet structures	Debris/trash present	Visual observation	Monthly and before every target storm	Remove and dispose of trash and debris Target completion period within 10 days.	None
Inspection for sediment management and characterization of sediment for removal	<ul style="list-style-type: none"> Sediment depth averages 18-inches or 10 percent of basin volume which ever is less Any parameter concentration (See Table 5.2, Vol II) exceeds 50% of Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% 	<ul style="list-style-type: none"> Measure depth at apparent maximum and minimum accumulation of sediment. Calculate average depth Sample according to OMM plan and send samples to lab 	June 1 each year	Remove and dispose of sediment. Regrade and revegetate if vegetation coverage drops below 70 percent. Revegetate with seed as required by threshold on Nov. 1	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	TTLIC, and the WET results exceed 50 % of the STLC value.				
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage. Where gophers are present, trap the gophers and level the mounds and 	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<p>firmly backfill the burrows to prevent seepage, erosion and leakage.</p> <ul style="list-style-type: none"> Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage. 	
Inspect for possible endangered species, threatened species and species of special	Evidence of ponding, emergence of wetland or woody vegetation, shrubs, dwarf plantain,	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> Remove woody vegetation, shrubs, dwarf plantain, pickleweed and woody 	<p>Vulnerable sites are:</p> <p>I-5/SR56 I-5/Manchester</p>

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
concern. within the BMP maintenance perimeter.	or burrowing animal damage. Presence of logs, woodpiles, rocks, or large debris.			wetland vegetation ³ in the basin within 10 days. <ul style="list-style-type: none"> • Remove debris, woodpiles etc. within 10 days. • Correct ponded areas using sand fill • For vulnerable sites, on Mar 1, deploy stakes with mylar strips and place scarecrow device around BMP. • If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrow before sealing the hole. 	I-15/SR-78
Inspect for standing water	Water accumulation in any structure or other	Standing water in any structure or other	Annually, May 1	Where gravity draining is possible,	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	location within the basin	location within the basin		drain the standing water	
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees or woody vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 10 working days, take corrective action. Consult engineers if immediate solution is not evident.	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
72 hour infiltration of design volume	Evidence of ponding water after 72 hours	Evaluation of water level within basin using data logging bubbler or visual observation of basin for evidence of ponding water	72 hours after target storm event	Remove sediment, scarify invert and revegetate before November 1. If problem persists, immediately notify engineer. Undertake investigation for course of action to achieve acceptable infiltration rate or other acceptable solution. If unable to achieve acceptable infiltration rate or implement alternative solution then move to decommission	None
Vegetation of basin invert and side slopes	Plant height exceeds 12 inches	Visual observation and random measurements through out the side slope and invert area	Monthly	Cut vegetation to a height of 6 inches and remove cuttings. Target completion period within 30 days.	None
Inspect for possible vector harborage	Standing water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment	None
Inspect for standing	Water accumulation in	Standing water in any	Annually, May 1	Where gravity	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
water	any structure or other location within the basin	structure or other location within the basin		draining is possible, drain the standing water	
Inspection for trash and debris at inlet structures	Debris/trash present	Visual observation	Monthly	Remove and dispose of debris/trash. Target completion period within 10 days.	None
Inspection for sediment management	Sediment accumulation greater than 18-inches or 10 percent of basin volume which ever is less	Measure depth at apparent maximum and minimum accumulation of sediment. Calculate average depth	June 1 each year	Remove, characterize and dispose of sediment. Regrade and revegetate if vegetation coverage drops below 70 percent. Revegetate with seed as required by threshold on Nov. 1	None
Inspection and characterization for sediment removal	Any parameter concentration (See Table 5.2, Vol II) exceeds 50% of Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% TTLC, and the WET results exceed 50 % of the STLC value.	Sample according to OMM plan and send samples to lab	May 1 each year	Remove and dispose of sediment regrade basin floor to ensure proper drainage. Revegetate on November 1 if coverage falls below 70%.	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Vegetation coverage inspection	Coverage falls below 70 percent	Visual observation	During month of September	Plant during month of November	None
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage. Where gophers are present, trap the gophers and level the mounds and firmly backfill the burrows to prevent 	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				seepage, erosion and leakage. <ul style="list-style-type: none"> Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage. 	
Inspect for possible endangered species, threatened species and species of special concern within the BMP maintenance	Evidence of ponding, emergence of wetland or woody vegetation, shrubs, dwarf plantain, or burrowing animal damage. Presence of	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> Remove woody vegetation, shrubs, dwarf plantain, pickleweed and woody wetland vegetation³ in the basin within 10 	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
perimeter.	logs, woodpiles, rocks, or large debris.			<p>days.</p> <ul style="list-style-type: none"> • Remove debris, woodpiles etc. within 10 days. • Correct ponded areas using sand fill. If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrow before sealing the hole. 	
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees or woody vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Design infiltration rate	Infiltration rate falls below 90 percent of design rate	Calculate infiltration rate with pressure transducer or measure in observation well	After each target storm	Immediately notify engineer. Undertake investigation for course of action to achieve acceptable infiltration rate. If unable to achieve acceptable infiltration then BMP operations cease.	Carlsbad MS – 1.2 in/hr Altadena MS – 1.5 in/hr
Inspect for possible vector harborage	Standing surface water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment	None
Inspection for trash and debris at inlet and outlet structures	Trash/debris present	Visual observation	Monthly	Remove and dispose of trash and debris. Target completion	None

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				period within 10 days.	
Inspect for sediment accumulation	Visible sediment	Visual inspection of the stone aggregate, no sediment should be visible at the top of the trench.	Monthly during the dry season After every storm greater than 0.5-inches	Remove top layer of trench, silt, filter fabric and stone, wash stone and reinstall fabric and stone into trench	None
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage. Where gophers are present, trap the 	None

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<p>gophers and level the mounds and firmly backfill the burrows to prevent seepage, erosion and leakage.</p> <ul style="list-style-type: none"> Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage. 	
Inspect for standing water at end of wet	Spreader ditch contains water	Visual observation	May 1 each year	Remove spreader ditch bypass plug during	Bypass plug will be installed throughout

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
season	following the wet season (i.e., June 1 through September 30)			first week of dry season to allow water to drain into infiltration trench. Remove bypass drain blockage monthly.	the wet season
Inspect for accumulation of sediment and debris in biofiltration strip spreader ditch	Spreader ditch contains sediment and debris following the wet season (i.e., June 1 through September 30)	Visual observation	Annually, during the first week of the dry season	Remove collected sediment and debris from the spreader ditch.	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric or other features damaged, emergence of trees or woody vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

MEDIA FILTERS – PERLITE/ZEOLITE

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Design flow rate through canisters: 15 gpm per canister	Less than 13 gpm flow rate per canister, measured collectively on a per vault basis	Evaluate peak and average flow rates drain time from inlet and outlet flow data loggers or staff gage within vaults	During one storm per month during wet season	Within 10 working days or as weather conditions permit, back flush canisters and remove sediment in the vault. If back flushing does not restore flow through rate, replace canisters.	None
Inspect for sediment accumulation in pre-treatment sedimentation chamber	Maximum 12-inches Any parameter concentration (See Vol II) exceeds 50% of Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% TTLC, and the WET results exceed	Measure with appropriate device Characterize sediment by sampling according to OMM plan Vol II	Measure sediment depth monthly during period of extended wet weather. Characterize sediment annually on May 1	Remove sediment within 10 days during wet season, characterize sediment and dispose of the sediment within 30 days If sediment characterization exceeds maintenance indicator, remove and dispose of sediment.	

MEDIA FILTERS – PERLITE/ZEOLITE

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	50 % of the STLC value.				
Inspect for minor maintenance	Per manufacture's guidelines	None	Monthly	Flush underdrains and other maintenance per manufacturer's guidelines.	None.
Manufacturer's recommended major maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Annually, May 1	Replace canisters, remove sediment and other maintenance per manufacturer's guidelines	None
Inspection for trash and debris at inlet and outlet structures and within vaults	Trash/debris present	Visual observation	Weekly during the wet season and monthly during the dry season	Remove and dispose of trash and debris. Target completion period within 1 day during wet season and 10 days during dry season.	None
Inspect for vector harborage	Standing water for more than 72 hours	Visual Observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment. Renew vector control briquettes every 3 months.	None
Inspect for standing water	Water accumulation in any structure or other location within the filter	Standing water in any structure or other location within the filter	Annually, May 1	Where gravity draining is possible, drain the standing water	None

MEDIA FILTERS – PERLITE/ZEOLITE

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
General Maintenance Inspection	Inlet structures, outlet structures, vault, piping, or other features damaged and for graffiti or vandalism	Visual observation	Monthly	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Design filter loading rate of 0.0545 gpm/sf (10.5 ft/d), or Drain time of 48 hours	Loading rate drops below 9 ft/d or Drain time exceeds 48 hours	Use staff gage in vault to measure loading rate, or Evaluate peak and average loading rates from inlet and outlet flow data loggers or.	During one storm event per month if staff gage is used. After one storm event per month during wet season	Remove sediment, trash and debris., remove top 2 inches of media and dispose of sediment. Restore media depth to 18 inches when overall media depth drops to 12 inches. Target completion period within 10 days. If problem persists, consult with engineer.	None.
Inspect for sediment accumulation in sedimentation chamber	Maximum 12-inches, or Any parameter concentration (See Vol II) exceeds 50% of Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than	Measure with appropriate device Characterize sediment by sampling according to OMM plan Vol II and send samples to lab	Measure sediment depth monthly during period of extended wet weather. Characterize sediment annually on May 1	Remove sediment within 10 days during wet season, characterize sediment and dispose of the sediment within 30 days If sediment characterization exceeds maintenance indicator, remove and dispose of sediment.	

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	50% TTLC, and the WET results exceed 50 % of the STLC value.				
Inspect for vector harborage	Standing water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment. Renew vector control briquettes every 3 months or as recommended by the VCD	None
Inspection for trash / debris at inlet and outlet structures and on media surface	Trash and debris present	Visual observation	Weekly during the wet season and monthly during the dry season	Remove and dispose of trash and debris. Target completion period within 1 day during wet season and 10 days during dry season.	None
Inspect pumps for proper functioning	Pump does not operate	Energize pump to see if water is discharged	September or after one month of inactivity during the wet season	Make assessment to determine if problem is electrical or mechanical. Take appropriate action. Replace pump if needed. Target completion time is 10 days (keep one pump	District 7 filters only

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				in storage as back-up)	
Inspect pumps for serviceability and periodic maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	District 7 filters only
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly backfill the burrows to prevent seepage, erosion and leakage. Where gophers are present, trap the gophers and level the mounds and 	None

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				<p>firmly backfill the burrows to prevent seepage, erosion and leakage.</p> <ul style="list-style-type: none"> Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly backfill the burrows to prevent seepage, erosion and leakage. 	
Inspect for possible endangered species, threatened species and species of special	Presence of bare ground, sparse ground cover, woodpiles, rocks, logs, rocks,	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> On March 1 place nylon/plastic mesh with mylar strips over the filter sand area to 	<p>Vulnerable sites:</p> <p>I-5/La Costa PR I-5/SR-78 PR</p>

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
concern within the BMP maintenance perimeter.	evidence of burrowing animal damage or evidence of ponding, emergence of wetland or woody vegetation, shrubs, dwarf plantain,			<p>prevent bird nesting. Remove the mesh and mylar in September each year. If nesting occurs in the BMP, immediately notify the engineer.</p> <ul style="list-style-type: none"> • Remove debris, woodpiles etc. within 10 days. • On Mar 1, deploy stakes with mylar strips and place scarecrow device around BMP. If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrows before sealing the hole. • Remove woody vegetation, shrubs, dwarf plantain, 	

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				pickleweed and woody wetland vegetation ³ outside the wetted pond area within 10 days.	
Inspect for standing water	Water accumulation in any structure or other location within the filter	Standing water in any structure or other location within the filter	Annually, May 1	Where gravity draining is possible, drain the standing water	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric or other features damaged, emergence of vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

MULTI-CHAMBER TREATMENT TRAINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Maximum filter drain time of 72 hrs for design and smaller storms	Drain time greater than 72 hours	Visual observation	After each target storm	If filter surface has sediment, remove and replace filter fabric blanket. Target completion period within 10 days. If problem persists, consult with engineer, the media may need to be replaced.	None
Inspection for trash/debris at inlet and outlet structures and the MCTT	Trash/debris present	Visual observation	Weekly during the wet season and monthly during the dry season	Remove and dispose of trash and debris. Target completion period within 1 day during wet season, 10 days during dry season..	None
Inspection for sediment accumulation	Maximum of 6-inches in main settling chamber Maximum of 2-feet grit chamber, or Any parameter concentration (See Vol II) exceeds 50% of	Measure with appropriate device Characterize sediment by sampling according to OMM plan Vol II	Measure sediment depth monthly during period of extended wet weather. Characterize sediment annually on May 1	Remove sediment within 10 days during wet season, characterize sediment and dispose of the sediment within 30 days If sediment characterization exceeds maintenance	None

MULTI-CHAMBER TREATMENT TRAINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% TTLC, and the WET results exceed 50 % of the STLC value.	and send samples to lab		indicator, remove and dispose of sediment.	
Inspect for possible vector harborage	Standing water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment. Renew vector control briquettes every 3 months.	None
Inspect for standing water	Water accumulation in any structure or other location within the device	Standing water in any structure or other location within the device	Annually, May 1	Where gravity draining is possible, drain the standing water	None
Replace filter media every 3 years per designer's specification	Operation greater than 3 years	Not applicable	Every 3 years	Remove and replace filter media	None
Renew sorbent pillows in main settling chamber every year per designer's	Not applicable	Not applicable	Annually at the end of the wet season	Renew sorbent pillows	None

MULTI-CHAMBER TREATMENT TRAINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
specification					
Inspect pumps for proper functioning	Pump does not operate	Energize pump to see if water is discharged	September or after one month of inactivity during the wet season	Make assessment to determine if problem is electrical or mechanical. Take appropriate action. Replace pump if needed. Target completion time is 10 days (keep one pump in storage as back-up)	None
Inspect pumps for serviceability and periodic maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric, settling tubes or other features damaged, emergence of vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

OIL-WATER SEPARATOR

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Inspect for sediment accumulation in the pre-separator and separator chamber	Greater than 12-inches	Measure with appropriate device	Monthly	Within 10 working days remove the accumulated material with a suction hose from a vacuum vehicle or portable pump.	None
Inspect for oil accumulation in oil chamber	Oil depth is not more than 50 percent of chamber volume	Gauge the level of oil/water with a wooden gauge stick	Monthly	Within 10 working days remove and dispose of oil and grease.	None
Inspect coalescer for debris and gummy deposits	Debris or gummy deposits present	Visual observation	Two times per year – at the beginning and end of each wet season (Sep 1 and April 15)	Wash the coalescer with a high-pressure hot water.	None
Inspect water level in tank	Less than full	Visual observation	Monthly	Fill with water within 1 day	None
Inspect for general mechanical integrity	Per manufacture's guidelines	Per manufacture's guidelines	Monthly during the wet season and before the beginning of the wet season	Operate each mechanical component to ensure proper operation. Repair as needed	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
24 hour draw down measured between the outlet structure and invert of the WQ orifice in the outlet structure..	Drawdown greater than 25 hours or water is flowing over weir.	Evaluate drain time from inlet and outlet flow data loggers or observe 25 hours after target storm. Observation of water flowing over spillway	After each target storm event	If >25-hours: Open gate to discharge water to permanent pool elevation, clear outlet of debris. Consult engineer if needed. If water is spilling over weir open canal gate until water level is at permanent pool elevation.	None
Inspect for burrowing rodent activity	Ground squirrel holes, vole or gopher mounds	Visual observation	Monthly, for rodent activity with abatement immediately if the activity affects the performance of the BMP otherwise abate annually in September	<ul style="list-style-type: none"> Where ground squirrels are active, firmly backfill the burrows to prevent seepage, erosion and leakage. Where ground squirrels are not active, confirm that no owl activity is present (a biologist may be needed if uncertain). Firmly 	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				backfill the burrows to prevent seepage, erosion and leakage. <ul style="list-style-type: none"> Where gophers are present, trap the gophers and level the mounds and firmly backfill the burrows to prevent seepage, erosion and leakage. Where voles are present, firmly backfill the burrows to prevent seepage, erosion and leakage If ground squirrel abatement is needed conduct a one time poisoning program. After the appropriate amount of time has passed (determined by the pesticide applicator), firmly 	

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				backfill the burrows to prevent seepage, erosion and leakage.	
Inspect for possible endangered species, threatened species and species of special concern within the BMP maintenance perimeter.	Evidence of emergence of woody vegetation, shrubs, dwarf plantain, or wetland vegetation, burrowing animal damage. Presence of logs, woodpiles, rocks, or large debris.	Visual observation	Weekly, during the wet season	<ul style="list-style-type: none"> • Remove woody vegetation, shrubs, dwarf plantain, pickleweed and woody wetland vegetation³ above the maintenance road area within 10 days. • Remove debris, woodpiles etc. within 10 days. • On Mar 1, deploy stakes with mylar strips and place scarecrow device around BMP. If burrows are found between Mar 1 and Aug 30, a biologist needs to confirm that no birds are nesting in the burrows before 	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
				sealing the hole. Remove floating debris and dead and floating vegetation mats within 10 days. •Maintain wetland vegetation only between August and February	
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, graffiti or vandalism, fence damage, etc.	Visual observation	Monthly	Within 10 working days, take corrective action. Consult engineers is immediate solution is not evident.	None
Inspect zone of periodic inundation vegetation	•Wetland plant density in the zone of periodic inundation is maintained at the “as constructed” density.	Visual observation/estimate	Annually, approx. May 1	By Nov 1 each year, restore to “as constructed” plant density	None
Inspect for sediment accumulation in forebay and main pond	More than 2 inches in the forebay and 4 inches in the main pond, or	Measure with appropriate device	Monthly	Remove and dispose of sediment. Target completion period within 30 days. If	La Costa site only

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
	Any parameter concentration (See Vol II) exceeds 50% of Title 22 TTLC. Or, if the parameter concentration falls between 10X STLC and TTLC, is less than 50% TTLC, and the WET results exceed 50 % of the STLC value.	Sample according to OMM plan Vol II and send samples to lab	May 1 each year	<p>vegetation coverage drops below 30 percent during maintenance operation, replant vegetation on November 1 to restore to 30 percent coverage</p> <p>If sediment characterization exceeds maintenance indicator, remove and dispose of sediment. Regrade. Revegetate, if vegetation coverage drops below 30 percent. Replant vegetation on November 1 to restore to 30 percent coverage</p>	

CONTINUOUS DEFLECTIVE SEPARATION (CDS) UNITS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS
Inspect for accumulation of trash and debris	Unit 85 percent full	Visual observation	Monthly during the wet season	Empty unit when the it is 85 percent full or annually in May, effect cleaning within 30 days	
Inspect for vector harborage	Standing water for more than 72 hours	Visual observation	Monthly and 72 hours after target storm event	Immediately notify VCD for vector abatement assessment.	None
Inspect the screen for damage and to ensure that it is properly fastened.	Screen becomes clogged, damaged or loose	Visual observation	Annually between September 15 and October 1)	Brush or high pressure wash the screen	None
Inspection for structural integrity	Holes in screen, large debris, damage to housing or weir box	Visual observation	Monthly or prior to a target storm during the wet season, and annually in May	Immediately consult with engineer and manufacturer's representative to develop a course of action, effect repairs within 10 working days	None

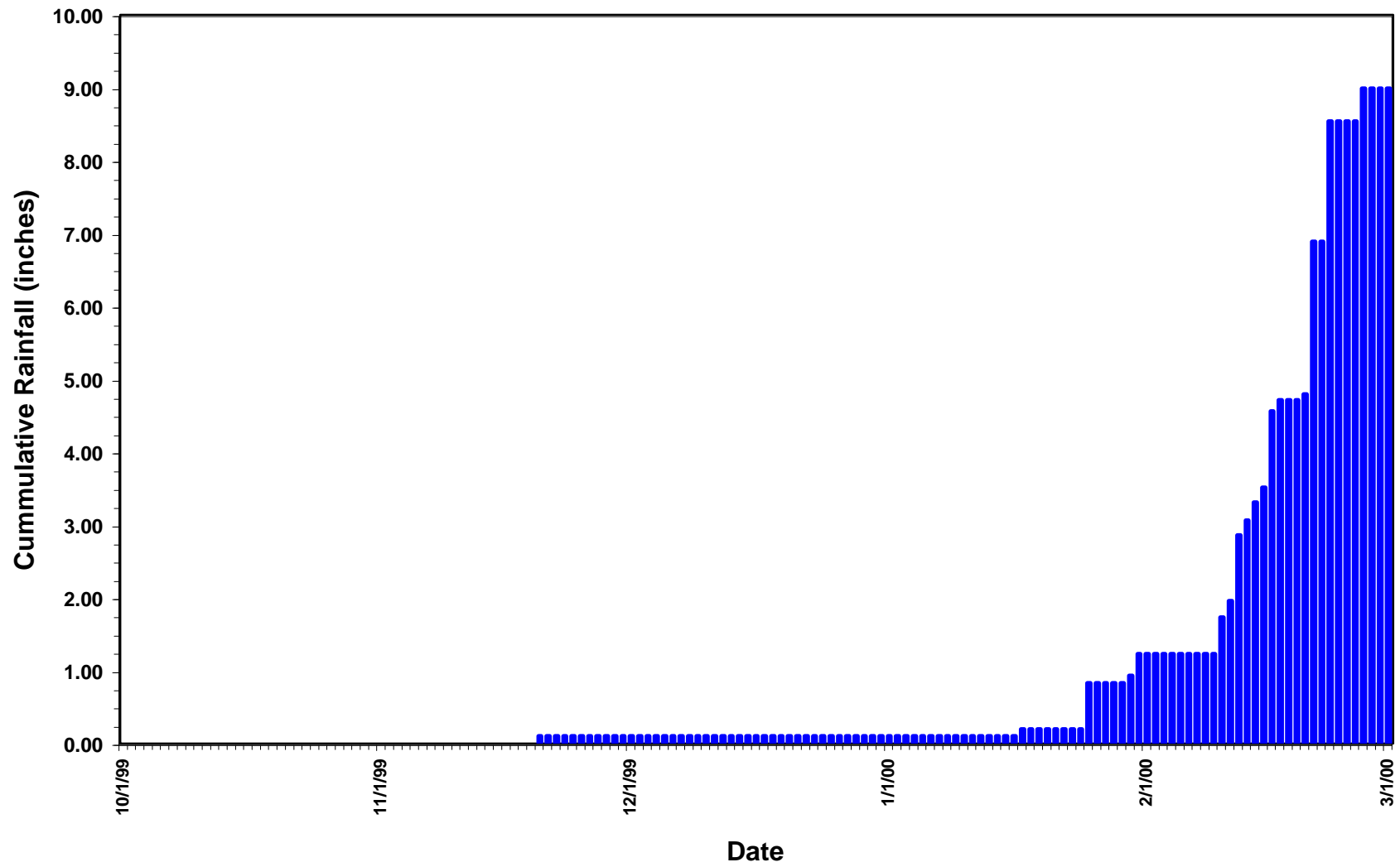
NOTES FOR ALL BMPS:

1. Design storm event is a storm that is a one year 24 hour recurrence frequency.
2. A target storm event is a storm with a predicted greater than 0.25 inches of rainfall or 0.1 inches for drain inlet inserts. Storm events should be separated by at least 72 hours of dry weather from the previous storm event.
3. Woody wetland vegetation consists of: willows (*Salix spp*), mule fat (*baccharis salicifolia*), cottonwood (*populus fremontii*), western sycamore (*plantanus racemosa*) and emergent large stature monocots including the genera *Cyperus*, *Juncus*, *Scirpus*, and *Typha*)

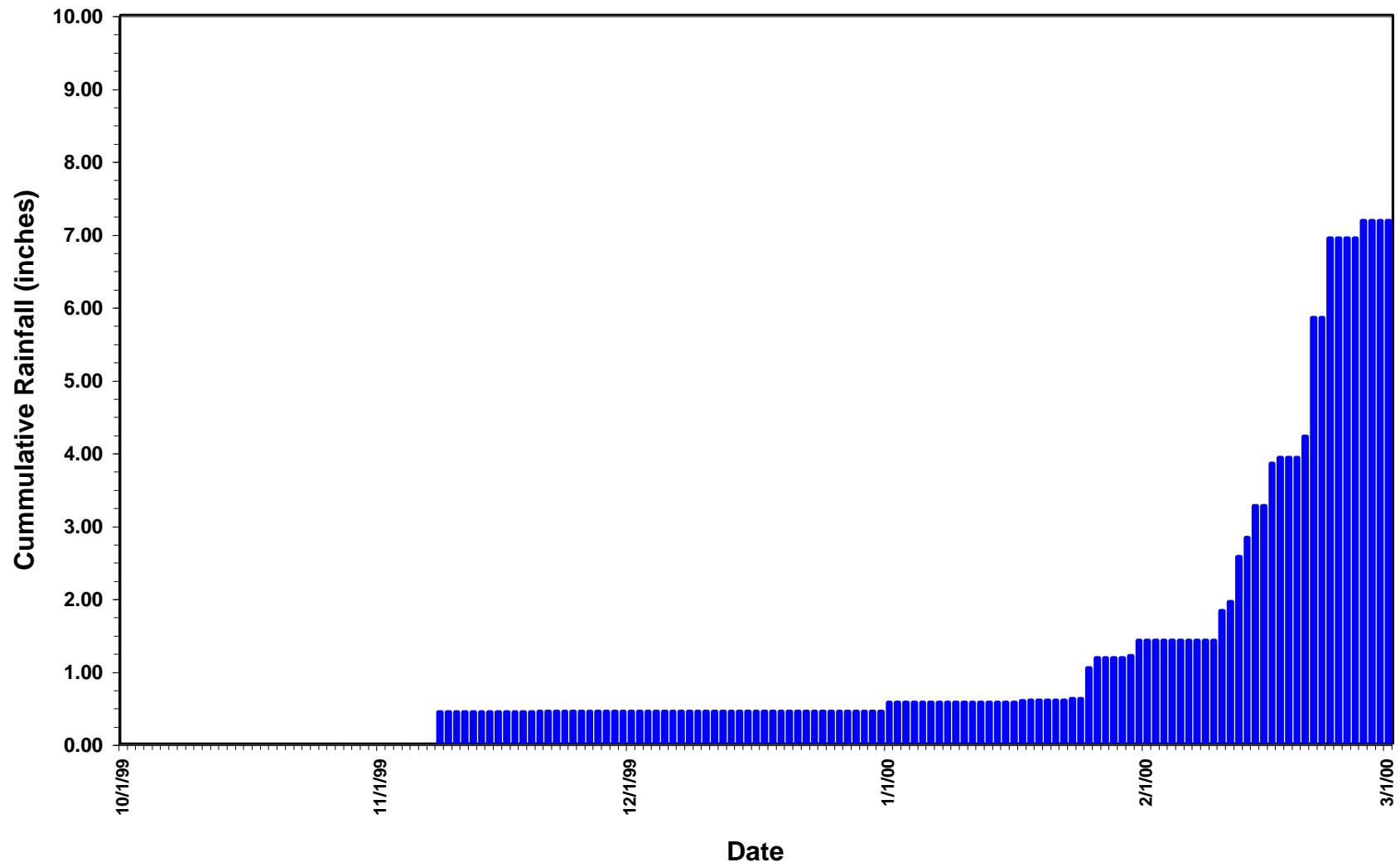
This Maintenance Indicator Document has been developed using site-specific information gathered by specialists trained in the identification of threatened and endangered species and their habitat. Information contained in this document includes guidance for inspection for possible threatened and endangered species harborage. Further, some of the maintenance recommendations are based on the requirements of specific plant species used in this Pilot Program. The recommendations provided in this document must be reassessed with respect to species and plant materials if the guidance contained herein is to be used for a separate project in another area.

APPENDIX J
REGIONAL RAINFALL DATA

Cumulative Rainfall for Arcadia



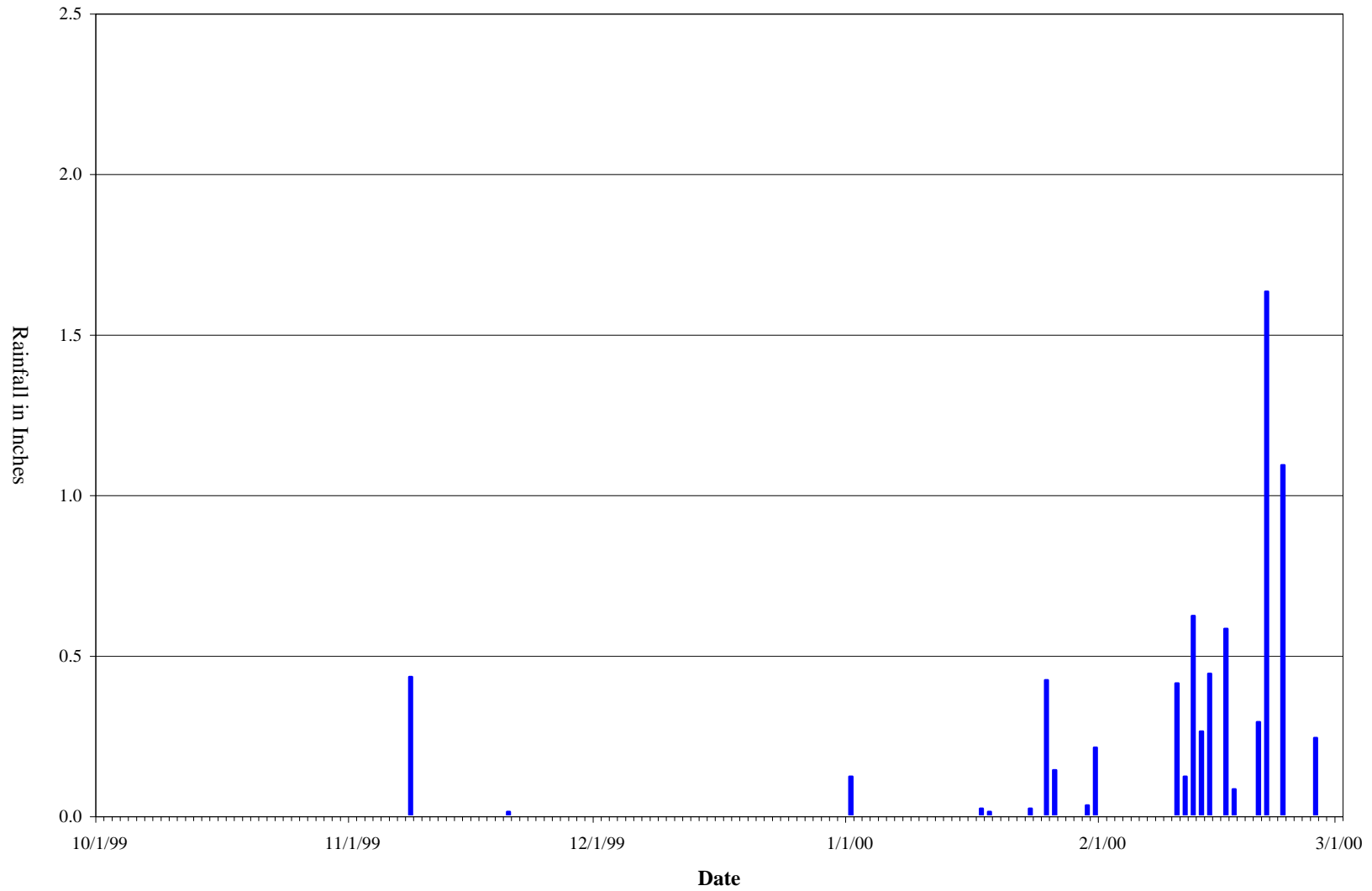
Cumulative Rainfall for L.A. Downtown/USC



Date	Arcadia		LA Downtown/USC		Notes
	Rainfall (in)	Cum. Rain (in)	Rainfall (in)	Cum. Rain (in)	
10/1/99	0.00	0.00	0.00	0.00	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
10/2/99	0.00	0.00	0.00	0.00	
10/3/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/4/99	0.00	0.00	0.00	0.00	
10/5/99	0.00	0.00	0.00	0.00	
10/6/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/7/99	0.00	0.00	0.00	0.00	
10/8/99	0.00	0.00	0.00	0.00	
10/9/99	0.00	0.00	0.00	0.00	
10/10/99	0.00	0.00	0.00	0.00	
10/11/99	0.00	0.00	0.00	0.00	
10/12/99	0.00	0.00	0.00	0.00	
10/13/99	0.00	0.00	0.00	0.00	
10/14/99	0.00	0.00	0.00	0.00	
10/15/99	0.00	0.00	0.00	0.00	
10/16/99	0.00	0.00	0.00	0.00	
10/17/99	0.00	0.00	0.00	0.00	
10/18/99	0.00	0.00	0.00	0.00	
10/19/99	0.00	0.00	0.00	0.00	
10/20/99	0.00	0.00	0.00	0.00	
10/21/99	0.00	0.00	0.00	0.00	
10/22/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/23/99	0.00	0.00	0.00	0.00	
10/24/99	0.00	0.00	0.00	0.00	
10/25/99	0.00	0.00	0.00	0.00	
10/26/99	0.00	0.00	0.00	0.00	
10/27/99	0.00	0.00	0.00	0.00	
10/28/99	0.00	0.00	0.00	0.00	
10/29/99	0.00	0.00	0.00	0.00	
10/30/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/31/99	0.00	0.00	0.00	0.00	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/1/99	0.00	0.00	0.00	0.00	
11/2/99	0.00	0.00	0.00	0.00	
11/3/99	0.00	0.00	0.00	0.00	
11/4/99	0.00	0.00	0.00	0.00	
11/5/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
11/6/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
11/7/99	0.00	0.00	0.00	0.00	
11/8/99	0.00	0.00	0.43	0.43	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/9/99	0.00	0.00	0.00	0.43	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/10/99	0.00	0.00	0.00	0.43	
11/11/99	0.00	0.00	0.00	0.43	Arcadia "Missing," so Monrovia is substituted
11/12/99	0.00	0.00	0.00	0.43	
11/13/99	0.00	0.00	0.00	0.43	
11/14/99	0.00	0.00	0.00	0.43	
11/15/99	0.00	0.00	0.00	0.43	Arcadia "Missing," so Monrovia is substituted
11/16/99	0.00	0.00	0.00	0.43	
11/17/99	0.00	0.00	0.00	0.43	
11/18/99	0.00	0.00	0.00	0.43	
11/19/99	0.00	0.00	0.00	0.43	
11/20/99	0.10	0.10	0.01	0.44	
11/21/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/22/99	0.00	0.10	0.00	0.44	
11/23/99	0.00	0.10	0.00	0.44	
11/24/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/25/99	0.00	0.10	0.00	0.44	
11/26/99	0.00	0.10	0.00	0.44	
11/27/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/28/99	0.00	0.10	0.00	0.44	
11/29/99	0.00	0.10	0.00	0.44	
11/30/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/1/99	0.00	0.10	0.00	0.44	
12/2/99	0.00	0.10	0.00	0.44	
12/3/99	0.00	0.10	0.00	0.44	
12/4/99	0.00	0.10	0.00	0.44	
12/5/99	0.00	0.10	0.00	0.44	
12/6/99	0.00	0.10	0.00	0.44	
12/7/99	0.00	0.10	0.00	0.44	
12/8/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/9/99	0.00	0.10	0.00	0.44	
12/10/99	0.00	0.10	0.00	0.44	
12/11/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/12/99	0.00	0.10	0.00	0.44	
12/13/99	0.00	0.10	0.00	0.44	

DISCLAIMER REQUIRED

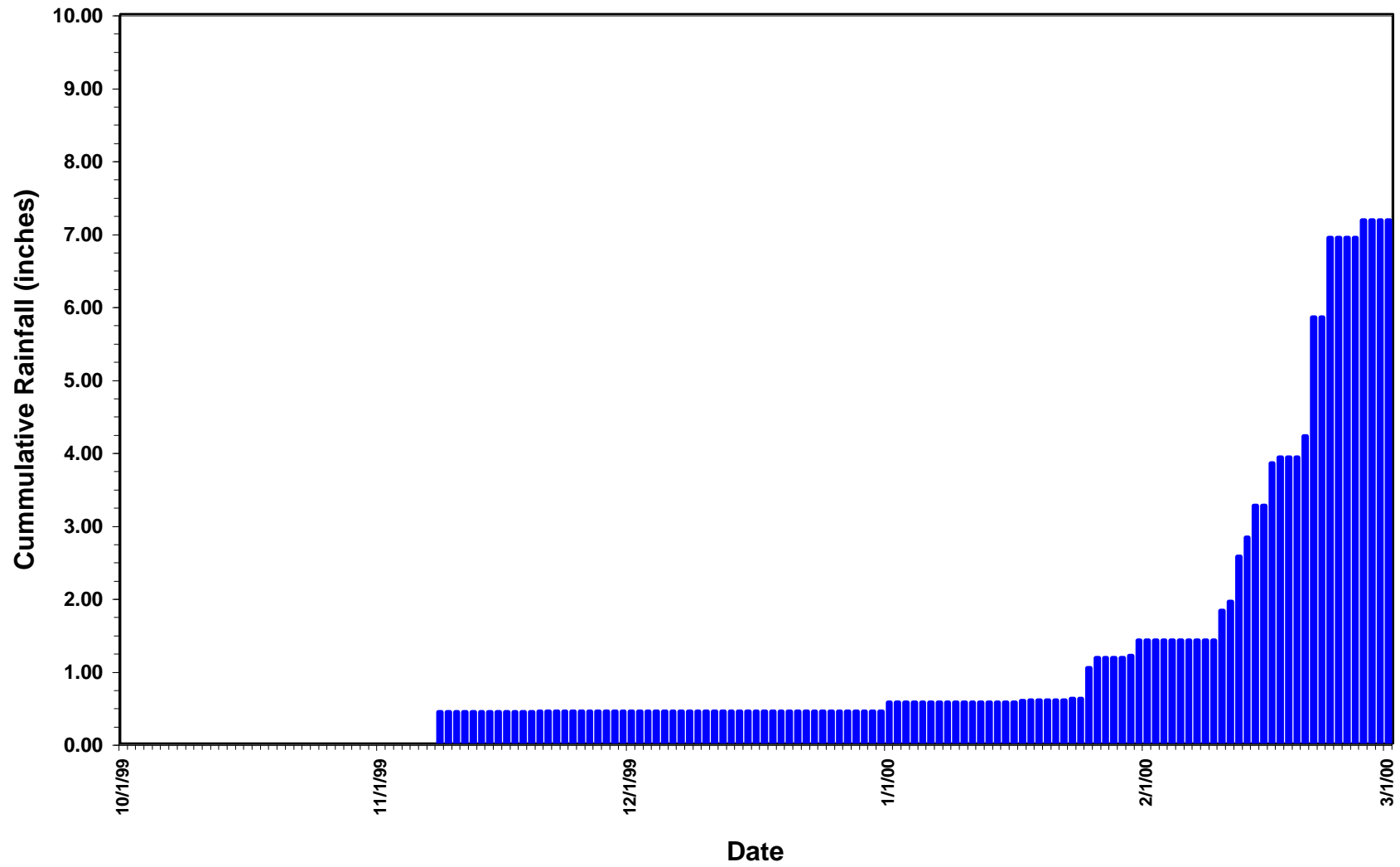
Daily Precipitation Totals for Downtown L.A./USC



12/14/99	0.00	0.10	0.00	0.44	
12/15/99	0.00	0.10	0.00	0.44	
12/16/99	0.00	0.10	0.00	0.44	
12/17/99	0.00	0.10	0.00	0.44	
12/18/99	0.00	0.10	0.00	0.44	
12/19/99	0.00	0.10	0.00	0.44	
12/20/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/21/99	0.00	0.10	0.00	0.44	
12/22/99	0.00	0.10	0.00	0.44	
12/23/99	0.00	0.10	0.00	0.44	
12/24/99	0.00	0.10	0.00	0.44	
12/25/99	0.00	0.10	0.00	0.44	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
12/26/99	0.00	0.10	0.00	0.44	
12/27/99	0.00	0.10	0.00	0.44	
12/28/99	0.00	0.10	0.00	0.44	
12/29/99	0.00	0.10	0.00	0.44	
12/30/99	0.00	0.10	0.00	0.44	
12/31/99	0.00	0.10	0.00	0.44	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
1/1/00	0.00	0.10	0.12	0.56	
1/2/00	0.00	0.10	0.00	0.56	
1/3/00	0.00	0.10	0.00	0.56	
1/4/00	0.00	0.10	0.00	0.56	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
1/5/00	0.00	0.10	0.00	0.56	
1/6/00	0.00	0.10	0.00	0.56	
1/7/00	0.00	0.10	0.00	0.56	
1/8/00	0.00	0.10	0.00	0.56	
1/9/00	0.00	0.10	0.00	0.56	
1/10/00	0.00	0.10	0.00	0.56	
1/11/00	0.00	0.10	0.00	0.56	
1/12/00	0.00	0.10	0.00	0.56	
1/13/00	0.00	0.10	0.00	0.56	
1/14/00	0.00	0.10	0.00	0.56	
1/15/00	0.00	0.10	0.00	0.56	
1/16/00	0.00	0.10	0.00	0.56	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
1/17/00	0.10	0.20	0.02	0.58	
1/18/00	0.00	0.20	0.01	0.59	
1/19/00	0.00	0.20	0.00	0.59	
1/20/00	0.00	0.20	0.00	0.59	
1/21/00	0.00	0.20	0.00	0.59	
1/22/00	0.00	0.20	0.00	0.59	
1/23/00	0.00	0.20	0.02	0.61	Arcadia "Missing," so Pasadena is substituted
1/24/00	0.00	0.20	0.00	0.61	
1/25/00	0.63	0.83	0.42	1.03	
1/26/00	0.00	0.83	0.14	1.17	
1/27/00	0.00	0.83	0.00	1.17	
1/28/00	0.00	0.83	0.00	1.17	Arcadia and Pasadena "Missing," zero is assumed
1/29/00	0.00	0.83	0.00	1.17	
1/30/00	0.10	0.93	0.03	1.20	
1/31/00	0.30	1.23	0.21	1.41	
2/1/00	0.00	1.23	0.00	1.41	
2/2/00	0.00	1.23	0.00	1.41	
2/3/00	0.00	1.23	0.00	1.41	
2/4/00	0.00	1.23	0.00	1.41	Arcadia and Pasadena "Missing," zero is assumed
2/5/00	0.00	1.23	0.00	1.41	Arcadia "Missing," zero is assumed
2/6/00	0.00	1.23	0.00	1.41	Arcadia "Missing," zero is assumed
2/7/00	0.00	1.23	0.00	1.41	
2/8/00	0.00	1.23	0.00	1.41	
2/9/00	0.00	1.23	0.00	1.41	
2/10/00	0.50	1.73	0.41	1.82	
2/11/00	0.23	1.96	0.12	1.94	Arcadia "Missing," so Pasadena is substituted
2/12/00	0.90	2.86	0.62	2.56	
2/13/00	0.20	3.06	0.26	2.82	
2/14/00	0.25	3.31	0.44	3.26	
2/15/00	0.20	3.51	0.00	3.26	
2/16/00	1.05	4.56	0.58	3.84	
2/17/00	0.15	4.71	0.08	3.92	
2/18/00	0.00	4.71	0.00	3.92	
2/19/00	0.00	4.71	0.00	3.92	
2/20/00	0.08	4.79	0.29	4.21	
2/21/00	2.10	6.89	1.63	5.84	
2/22/00	0.00	6.89	0.00	5.84	
2/23/00	1.65	8.54	1.09	6.93	
2/24/00	0.00	8.54	0.00	6.93	
2/25/00	0.00	8.54	0.00	6.93	
2/26/00	0.00	8.54	0.00	6.93	
2/27/00	0.45	8.99	0.24	7.17	
2/28/00	0.00	8.99	0.00	7.17	

2/29/00	0.00	8.99	0.00	7.17	
3/1/00	0.00	8.99	0.00	7.17	

Cumulative Rainfall for L.A. Downtown/USC



Date	Arcadia		LA Downtown/USC		Notes
	Rainfall (in)	Cum. Rain (in)	Rainfall (in)	Cum. Rain (in)	
10/1/99	0.00	0.00	0.00	0.00	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
10/2/99	0.00	0.00	0.00	0.00	
10/3/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/4/99	0.00	0.00	0.00	0.00	
10/5/99	0.00	0.00	0.00	0.00	
10/6/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/7/99	0.00	0.00	0.00	0.00	
10/8/99	0.00	0.00	0.00	0.00	
10/9/99	0.00	0.00	0.00	0.00	
10/10/99	0.00	0.00	0.00	0.00	
10/11/99	0.00	0.00	0.00	0.00	
10/12/99	0.00	0.00	0.00	0.00	
10/13/99	0.00	0.00	0.00	0.00	
10/14/99	0.00	0.00	0.00	0.00	
10/15/99	0.00	0.00	0.00	0.00	
10/16/99	0.00	0.00	0.00	0.00	
10/17/99	0.00	0.00	0.00	0.00	
10/18/99	0.00	0.00	0.00	0.00	
10/19/99	0.00	0.00	0.00	0.00	
10/20/99	0.00	0.00	0.00	0.00	
10/21/99	0.00	0.00	0.00	0.00	
10/22/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/23/99	0.00	0.00	0.00	0.00	
10/24/99	0.00	0.00	0.00	0.00	
10/25/99	0.00	0.00	0.00	0.00	
10/26/99	0.00	0.00	0.00	0.00	
10/27/99	0.00	0.00	0.00	0.00	
10/28/99	0.00	0.00	0.00	0.00	
10/29/99	0.00	0.00	0.00	0.00	
10/30/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
10/31/99	0.00	0.00	0.00	0.00	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/1/99	0.00	0.00	0.00	0.00	
11/2/99	0.00	0.00	0.00	0.00	
11/3/99	0.00	0.00	0.00	0.00	
11/4/99	0.00	0.00	0.00	0.00	
11/5/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
11/6/99	0.00	0.00	0.00	0.00	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
11/7/99	0.00	0.00	0.00	0.00	
11/8/99	0.00	0.00	0.43	0.43	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/9/99	0.00	0.00	0.00	0.43	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
11/10/99	0.00	0.00	0.00	0.43	
11/11/99	0.00	0.00	0.00	0.43	Arcadia "Missing," so Monrovia is substituted
11/12/99	0.00	0.00	0.00	0.43	
11/13/99	0.00	0.00	0.00	0.43	
11/14/99	0.00	0.00	0.00	0.43	
11/15/99	0.00	0.00	0.00	0.43	Arcadia "Missing," so Monrovia is substituted
11/16/99	0.00	0.00	0.00	0.43	
11/17/99	0.00	0.00	0.00	0.43	
11/18/99	0.00	0.00	0.00	0.43	
11/19/99	0.00	0.00	0.00	0.43	
11/20/99	0.10	0.10	0.01	0.44	
11/21/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/22/99	0.00	0.10	0.00	0.44	
11/23/99	0.00	0.10	0.00	0.44	
11/24/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/25/99	0.00	0.10	0.00	0.44	
11/26/99	0.00	0.10	0.00	0.44	
11/27/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
11/28/99	0.00	0.10	0.00	0.44	
11/29/99	0.00	0.10	0.00	0.44	
11/30/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/1/99	0.00	0.10	0.00	0.44	
12/2/99	0.00	0.10	0.00	0.44	
12/3/99	0.00	0.10	0.00	0.44	
12/4/99	0.00	0.10	0.00	0.44	
12/5/99	0.00	0.10	0.00	0.44	
12/6/99	0.00	0.10	0.00	0.44	
12/7/99	0.00	0.10	0.00	0.44	
12/8/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/9/99	0.00	0.10	0.00	0.44	
12/10/99	0.00	0.10	0.00	0.44	
12/11/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/12/99	0.00	0.10	0.00	0.44	
12/13/99	0.00	0.10	0.00	0.44	

DISCLAIMER REQUIRED

12/14/99	0.00	0.10	0.00	0.44	
12/15/99	0.00	0.10	0.00	0.44	
12/16/99	0.00	0.10	0.00	0.44	
12/17/99	0.00	0.10	0.00	0.44	
12/18/99	0.00	0.10	0.00	0.44	
12/19/99	0.00	0.10	0.00	0.44	
12/20/99	0.00	0.10	0.00	0.44	Arcadia "Missing," so Monrovia is substituted
12/21/99	0.00	0.10	0.00	0.44	
12/22/99	0.00	0.10	0.00	0.44	
12/23/99	0.00	0.10	0.00	0.44	
12/24/99	0.00	0.10	0.00	0.44	
12/25/99	0.00	0.10	0.00	0.44	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
12/26/99	0.00	0.10	0.00	0.44	
12/27/99	0.00	0.10	0.00	0.44	
12/28/99	0.00	0.10	0.00	0.44	
12/29/99	0.00	0.10	0.00	0.44	
12/30/99	0.00	0.10	0.00	0.44	
12/31/99	0.00	0.10	0.00	0.44	Arcadia, Monrovia, and Pasadena "Missing," zero is assumed
1/1/00	0.00	0.10	0.12	0.56	
1/2/00	0.00	0.10	0.00	0.56	
1/3/00	0.00	0.10	0.00	0.56	
1/4/00	0.00	0.10	0.00	0.56	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
1/5/00	0.00	0.10	0.00	0.56	
1/6/00	0.00	0.10	0.00	0.56	
1/7/00	0.00	0.10	0.00	0.56	
1/8/00	0.00	0.10	0.00	0.56	
1/9/00	0.00	0.10	0.00	0.56	
1/10/00	0.00	0.10	0.00	0.56	
1/11/00	0.00	0.10	0.00	0.56	
1/12/00	0.00	0.10	0.00	0.56	
1/13/00	0.00	0.10	0.00	0.56	
1/14/00	0.00	0.10	0.00	0.56	
1/15/00	0.00	0.10	0.00	0.56	
1/16/00	0.00	0.10	0.00	0.56	Arcadia "Missing," Monrovia "Missing," so Pasadena is substituted
1/17/00	0.10	0.20	0.02	0.58	
1/18/00	0.00	0.20	0.01	0.59	
1/19/00	0.00	0.20	0.00	0.59	
1/20/00	0.00	0.20	0.00	0.59	
1/21/00	0.00	0.20	0.00	0.59	
1/22/00	0.00	0.20	0.00	0.59	
1/23/00	0.00	0.20	0.02	0.61	Arcadia "Missing," so Pasadena is substituted
1/24/00	0.00	0.20	0.00	0.61	
1/25/00	0.63	0.83	0.42	1.03	
1/26/00	0.00	0.83	0.14	1.17	
1/27/00	0.00	0.83	0.00	1.17	
1/28/00	0.00	0.83	0.00	1.17	Arcadia and Pasadena "Missing," zero is assumed
1/29/00	0.00	0.83	0.00	1.17	
1/30/00	0.10	0.93	0.03	1.20	
1/31/00	0.30	1.23	0.21	1.41	
2/1/00	0.00	1.23	0.00	1.41	
2/2/00	0.00	1.23	0.00	1.41	
2/3/00	0.00	1.23	0.00	1.41	
2/4/00	0.00	1.23	0.00	1.41	Arcadia and Pasadena "Missing," zero is assumed
2/5/00	0.00	1.23	0.00	1.41	Arcadia "Missing," zero is assumed
2/6/00	0.00	1.23	0.00	1.41	Arcadia "Missing," zero is assumed
2/7/00	0.00	1.23	0.00	1.41	
2/8/00	0.00	1.23	0.00	1.41	
2/9/00	0.00	1.23	0.00	1.41	
2/10/00	0.50	1.73	0.41	1.82	
2/11/00	0.23	1.96	0.12	1.94	Arcadia "Missing," so Pasadena is substituted
2/12/00	0.90	2.86	0.62	2.56	
2/13/00	0.20	3.06	0.26	2.82	
2/14/00	0.25	3.31	0.44	3.26	
2/15/00	0.20	3.51	0.00	3.26	
2/16/00	1.05	4.56	0.58	3.84	
2/17/00	0.15	4.71	0.08	3.92	
2/18/00	0.00	4.71	0.00	3.92	
2/19/00	0.00	4.71	0.00	3.92	
2/20/00	0.08	4.79	0.29	4.21	
2/21/00	2.10	6.89	1.63	5.84	
2/22/00	0.00	6.89	0.00	5.84	
2/23/00	1.65	8.54	1.09	6.93	
2/24/00	0.00	8.54	0.00	6.93	
2/25/00	0.00	8.54	0.00	6.93	
2/26/00	0.00	8.54	0.00	6.93	
2/27/00	0.45	8.99	0.24	7.17	
2/28/00	0.00	8.99	0.00	7.17	

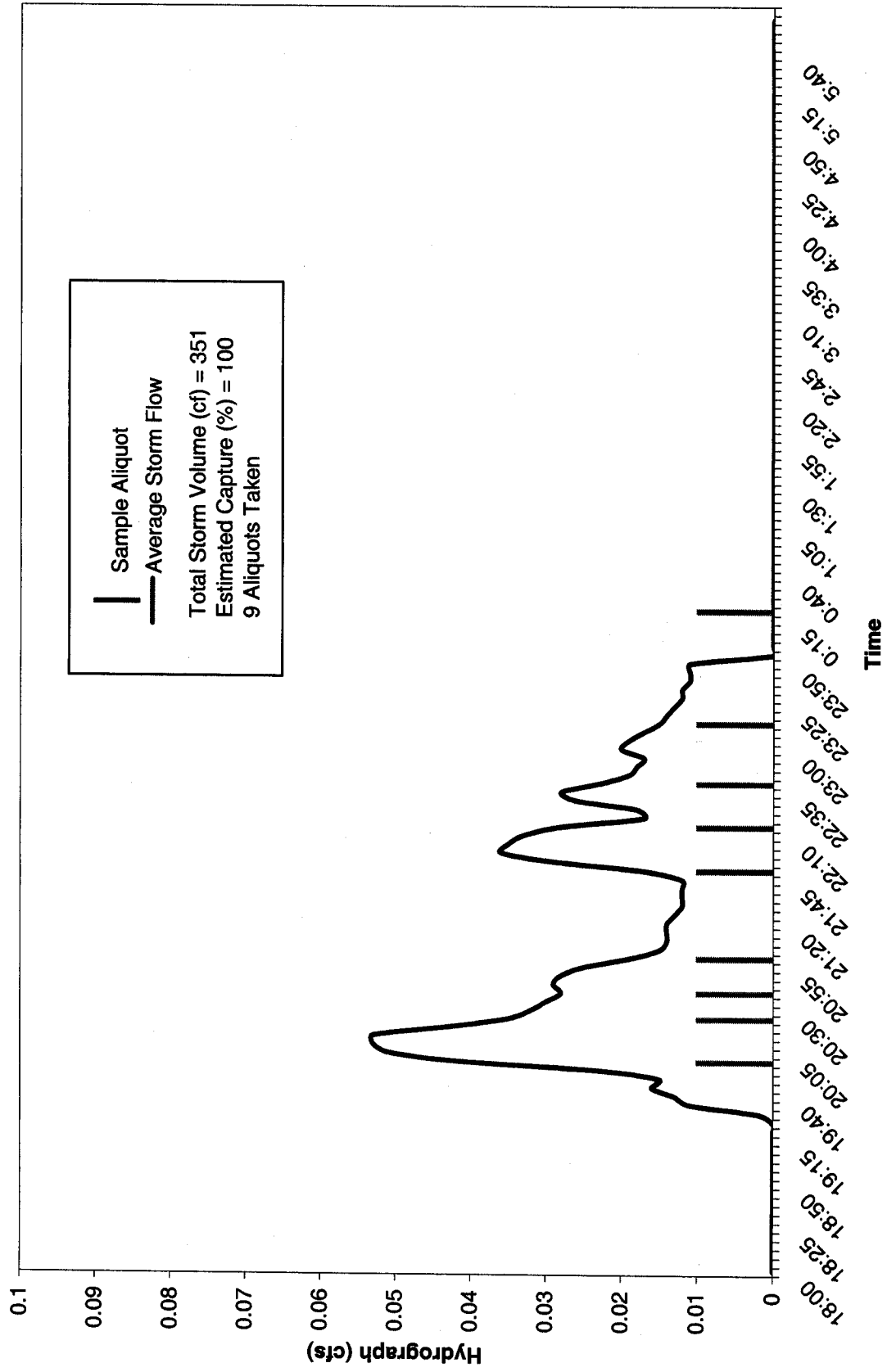
2/29/00	0.00	8.99	0.00	7.17	
3/1/00	0.00	8.99	0.00	7.17	

APPENDIX K
HYDROGRAPHS FOR SITE EVENTS WITH LESS THAN 12
SAMPLE ALIQUOTS

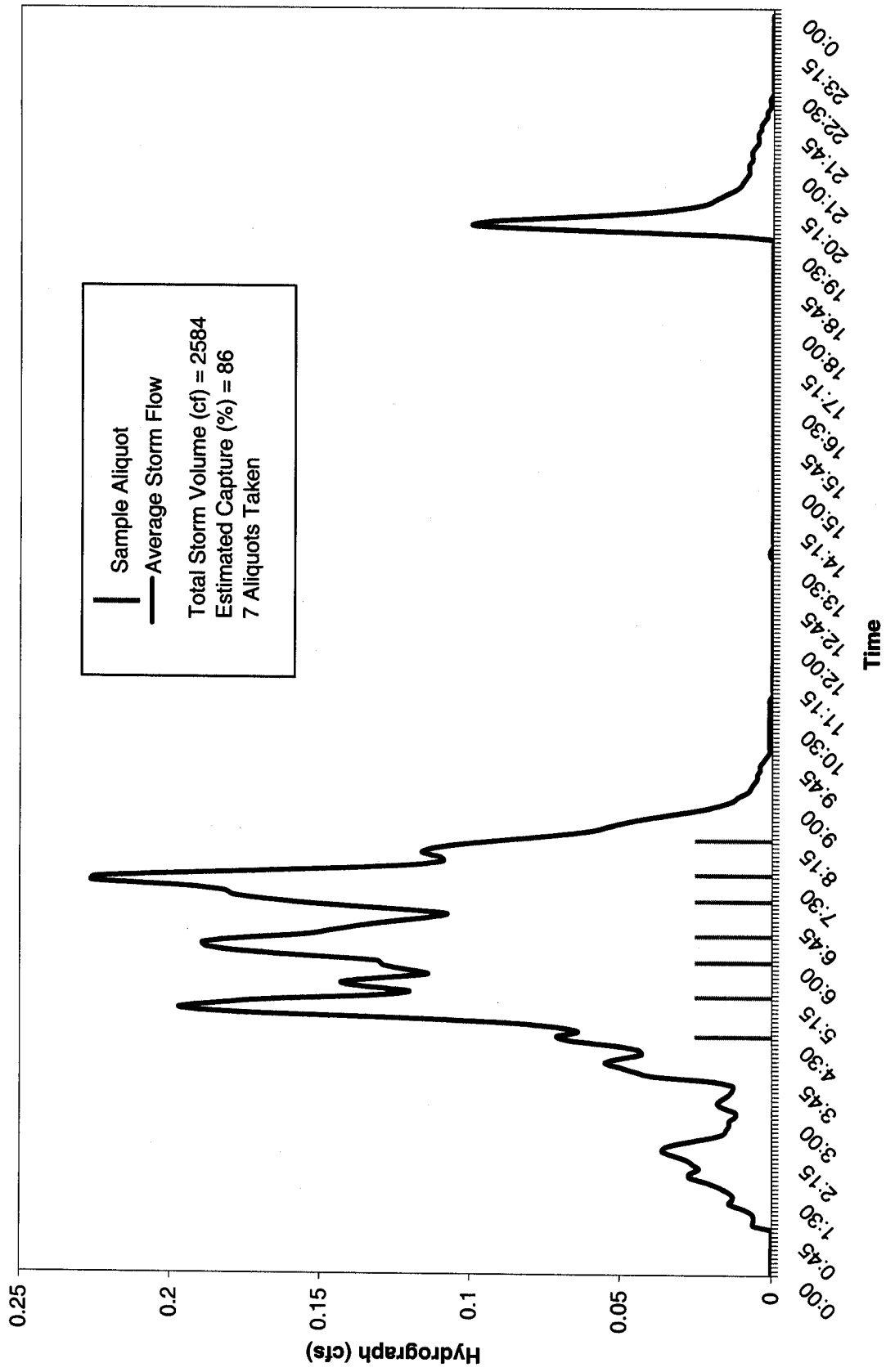
Summary Table

Site	Date	# Aliquots	Storm Capture (%)
Foothill MS Fossil Filter DII	01/25/2000	3	88
Las Flores MS Fossil Filter DII	01/25/2000	11	97
Rosemead MS Fossil Filter DII	01/25/2000	9	94
Altadena MS Biostrip Influent	01/25/2000	7	86
Foothill MS Fossil Filter DII	01/31/2000	9	100

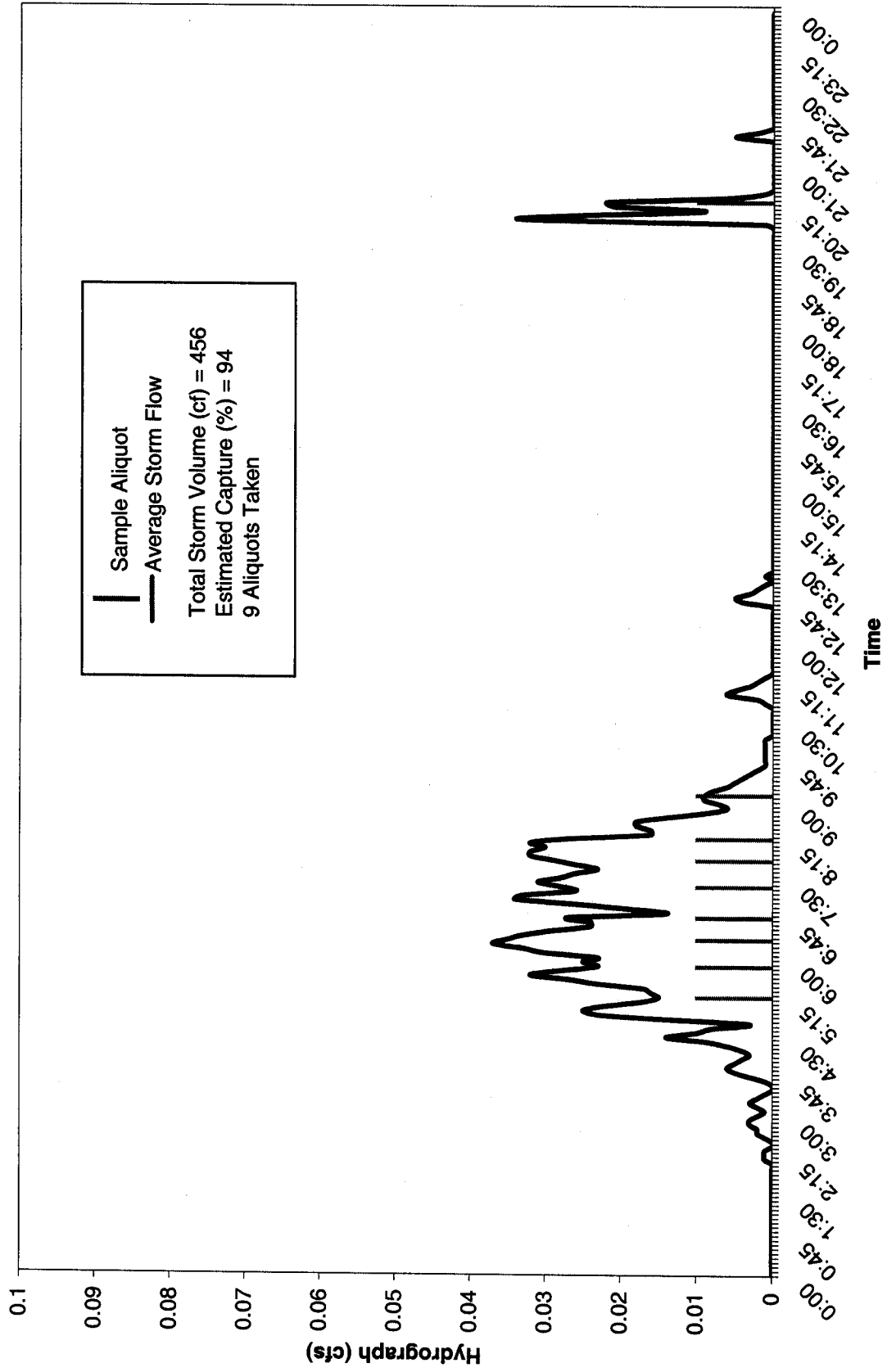
Hydrograph for Foothill MS Fossil Filter DII on January 30-31, 2000



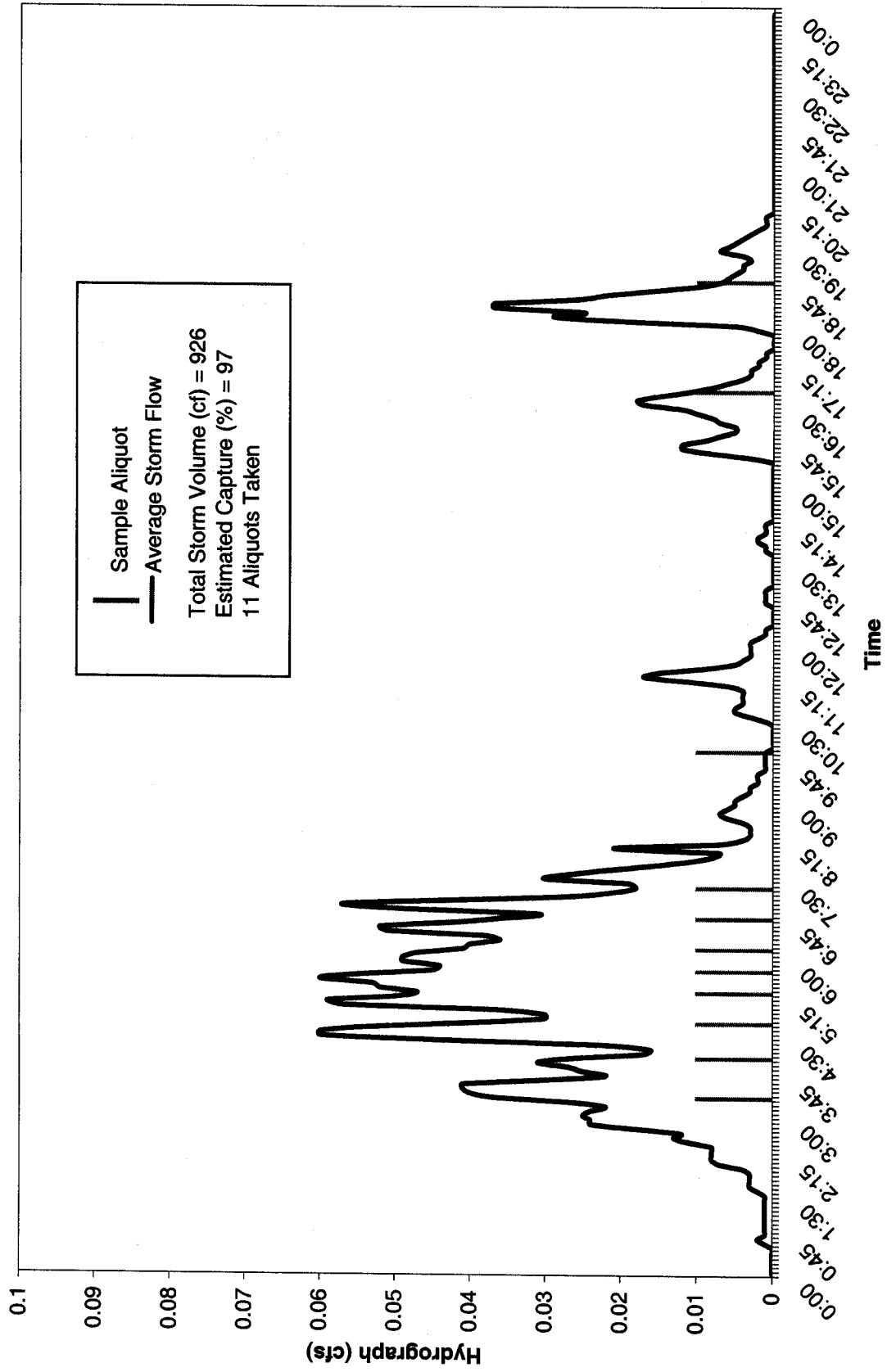
Hydrograph for Altadena MS Biostrip Influent on January 25, 2000



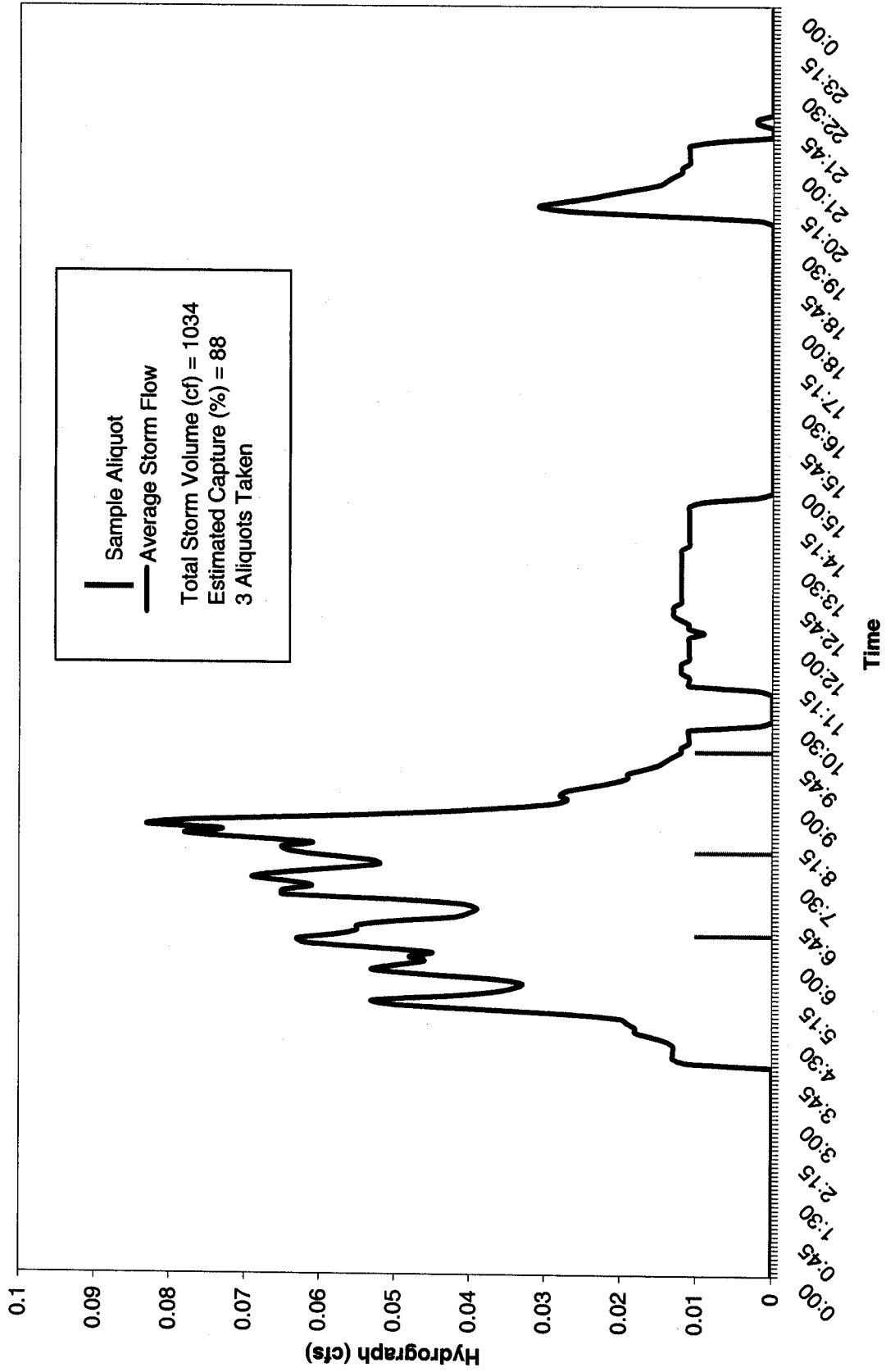
Hydrograph for Rosemead MS Fossil Filter DII on January 25, 2000



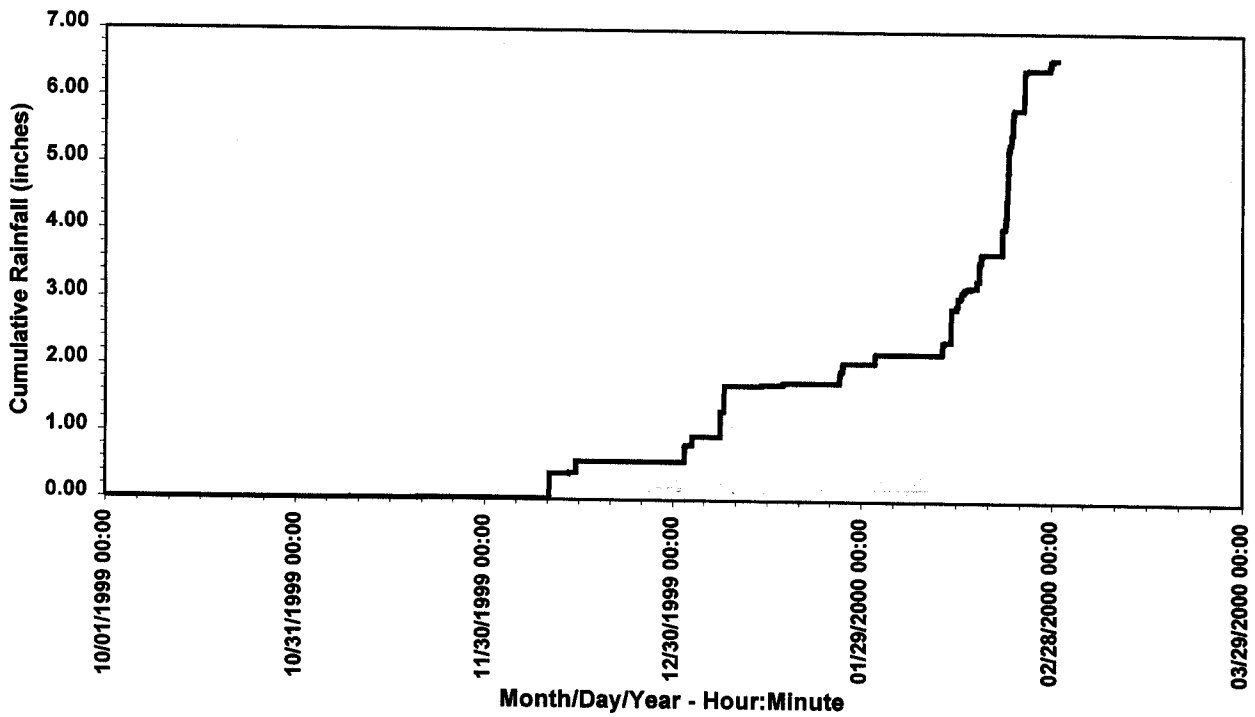
Hydrograph for Las Flores MS Fossil Filter DII on January 25, 2000



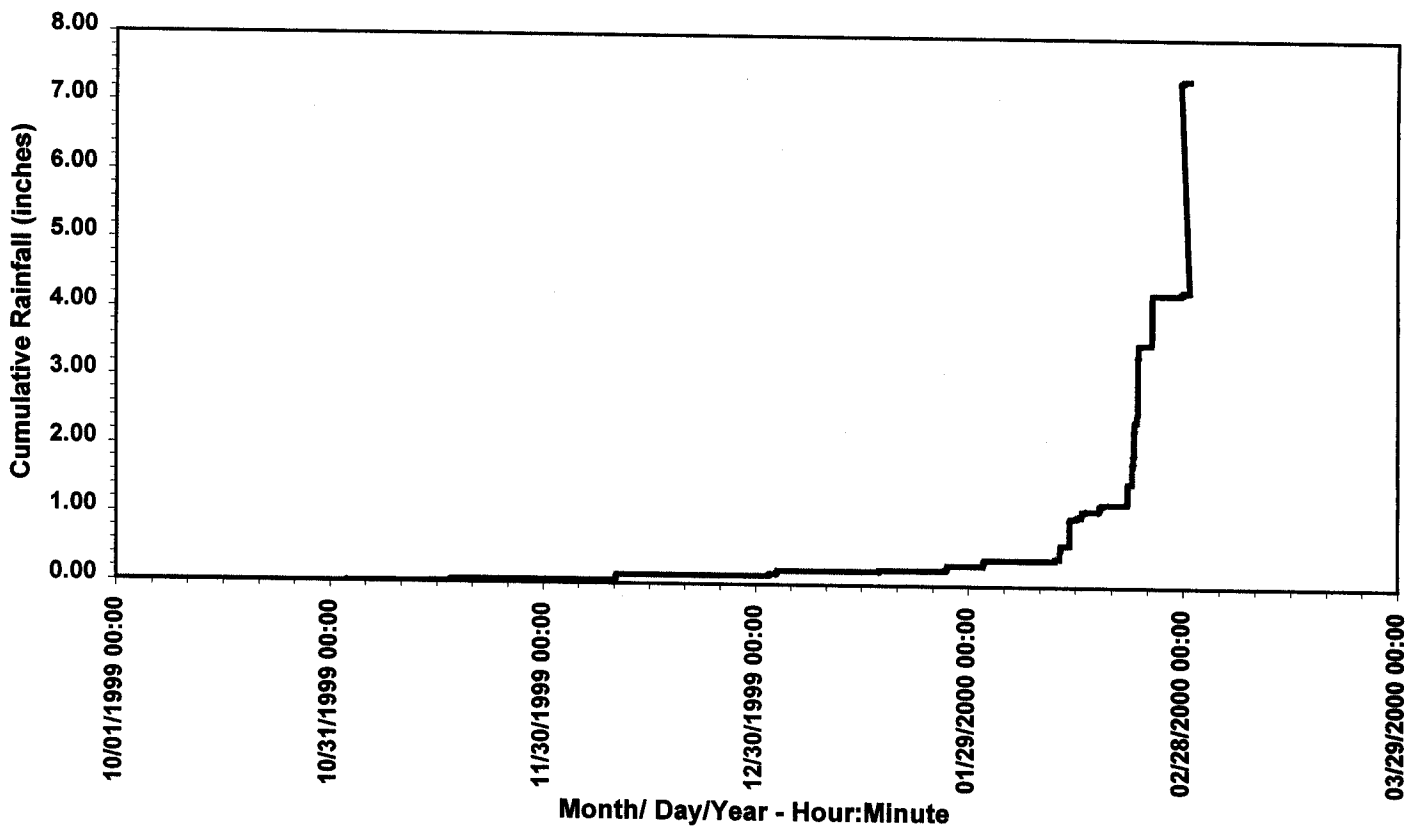
Hydrograph for Foothill MS Fossil Filter DII on January 25, 2000



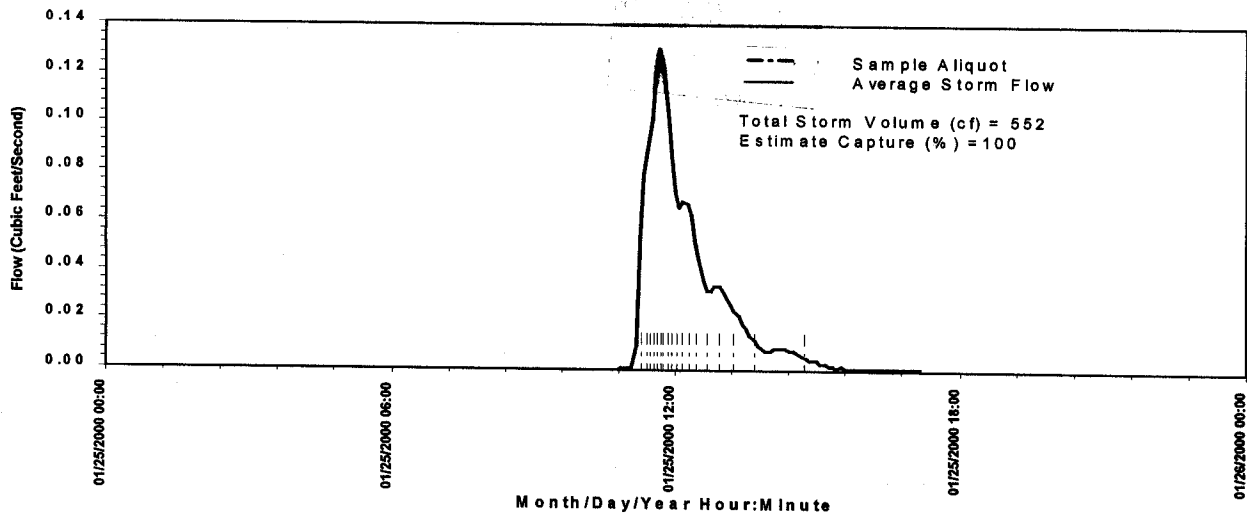
Cumulative Rainfall for North County San Diego from Escondido Maintenance Station
10/01/1999 - 2/29/2000



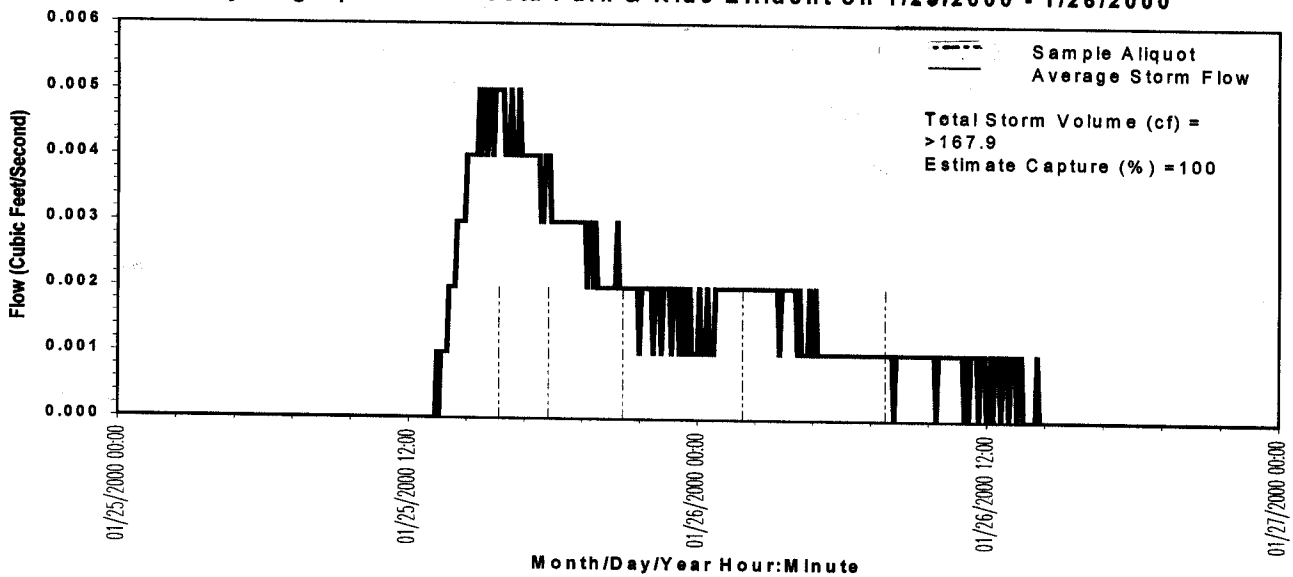
Cumulative Rainfall for South County San Diego from Kearny Mesa Maint. Station
10/01/1999 - 2/29/2000



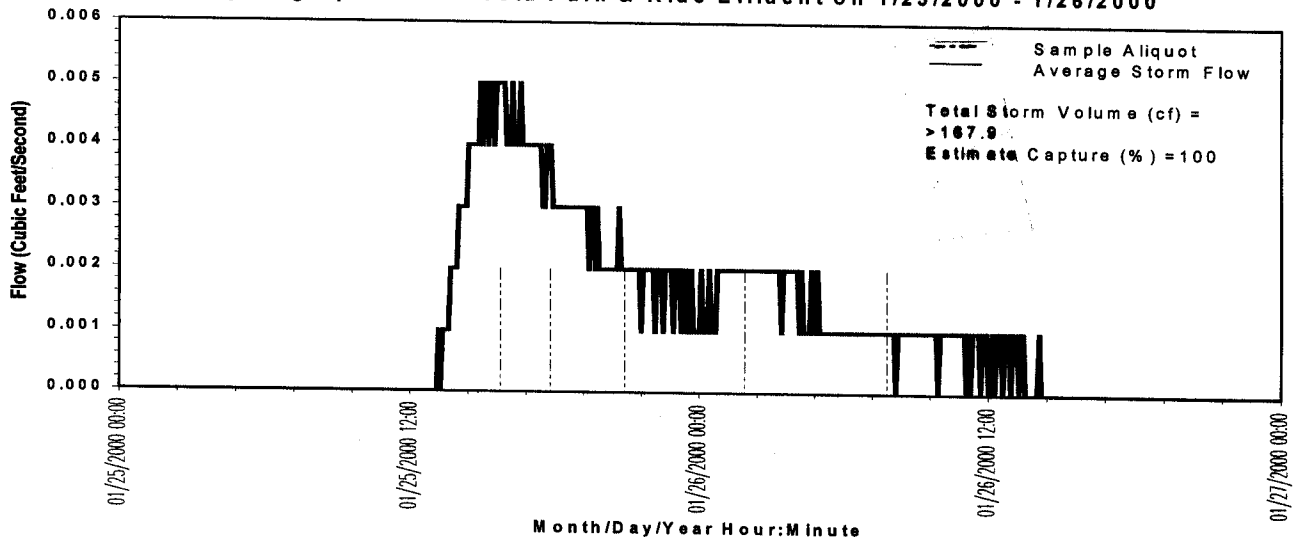
Hydrograph for La Costa Park & Ride Influent on 1/25/2000



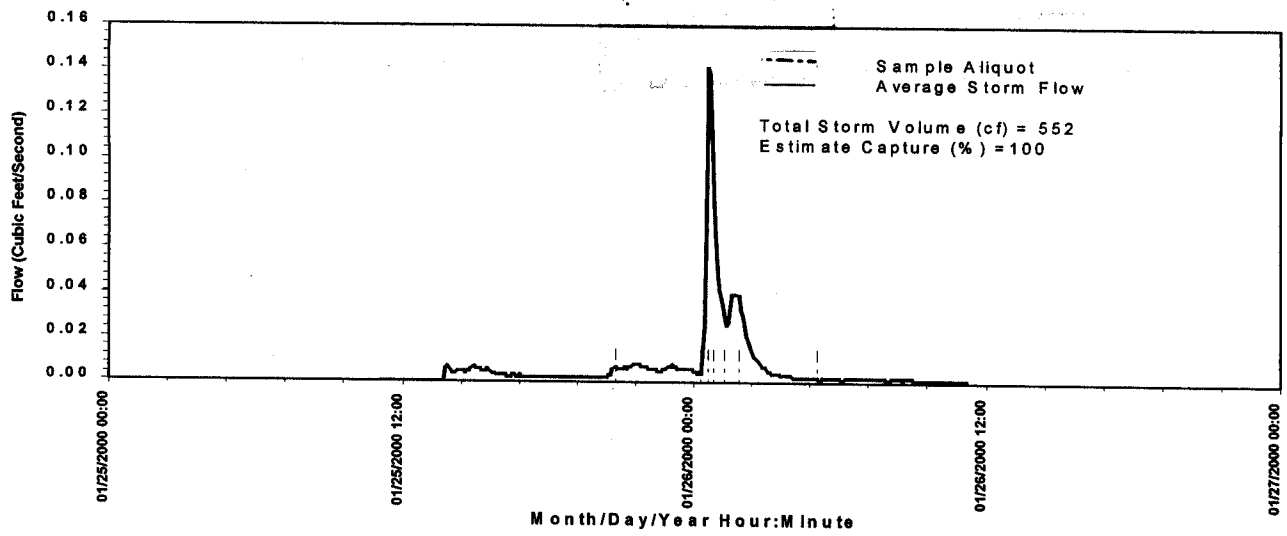
Hydrograph for LaCosta Park & Ride Effluent on 1/25/2000 - 1/26/2000



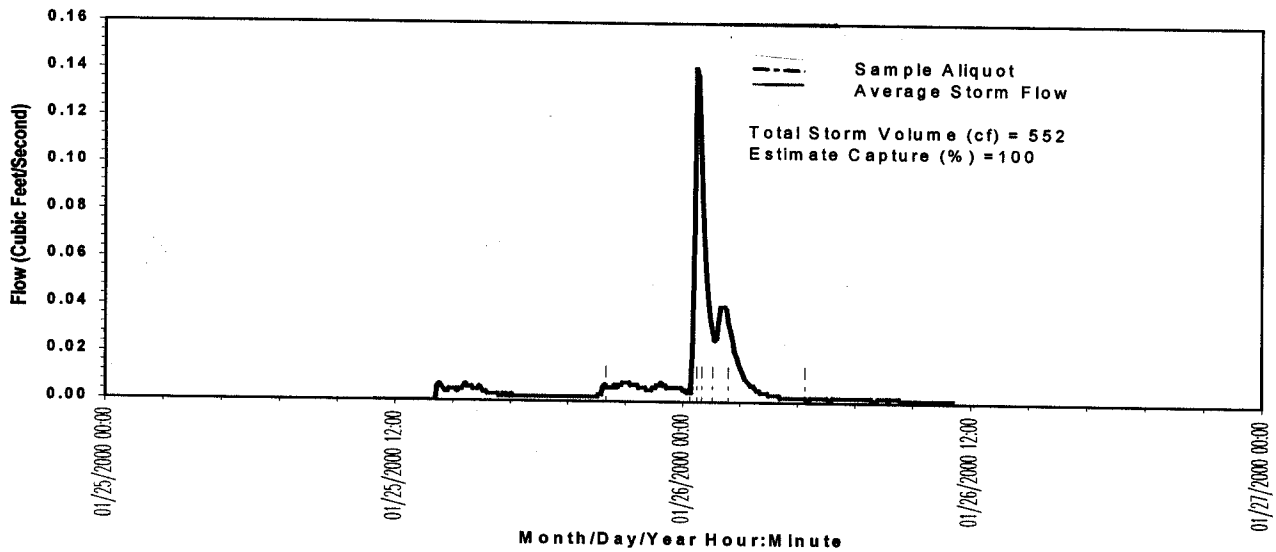
Hydrograph for LaCosta Park & Ride Effluent on 1/25/2000 - 1/26/2000



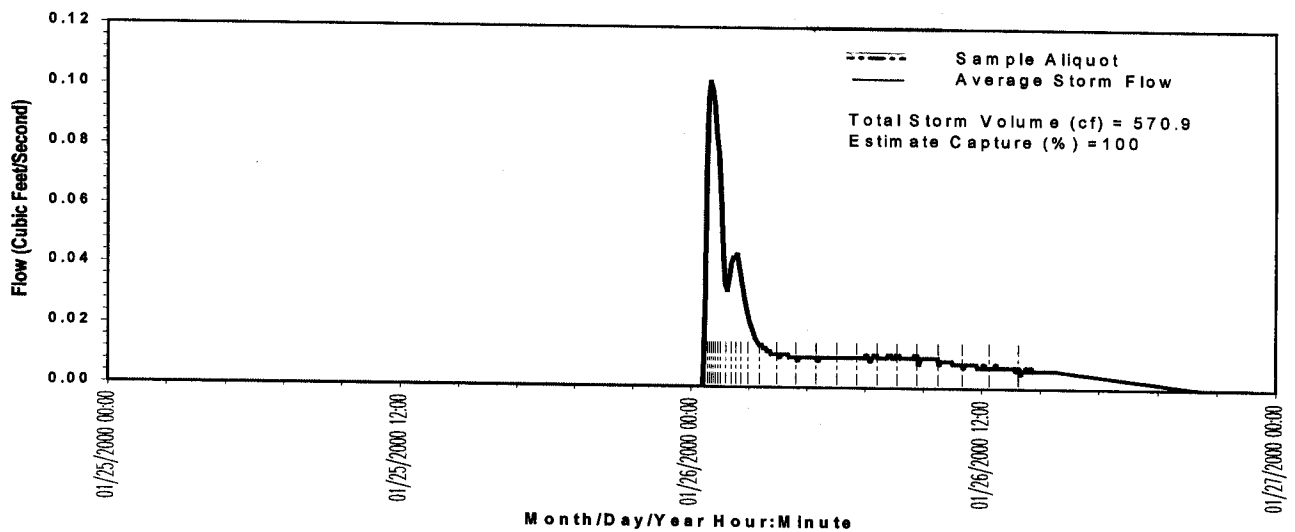
Hydrograph for Kearny Mesa Maintenance Station Influent on 1/25 - 1/26/2000



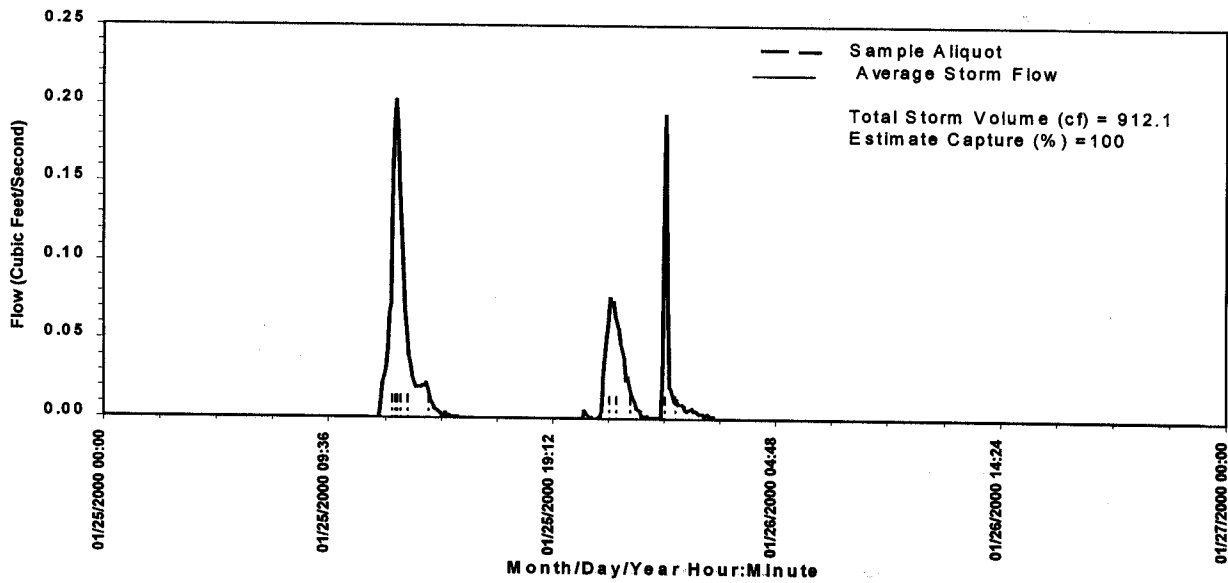
Hydrograph for Kearny Mesa Maintenance Station Influent on 1/25 - 1/26/2000



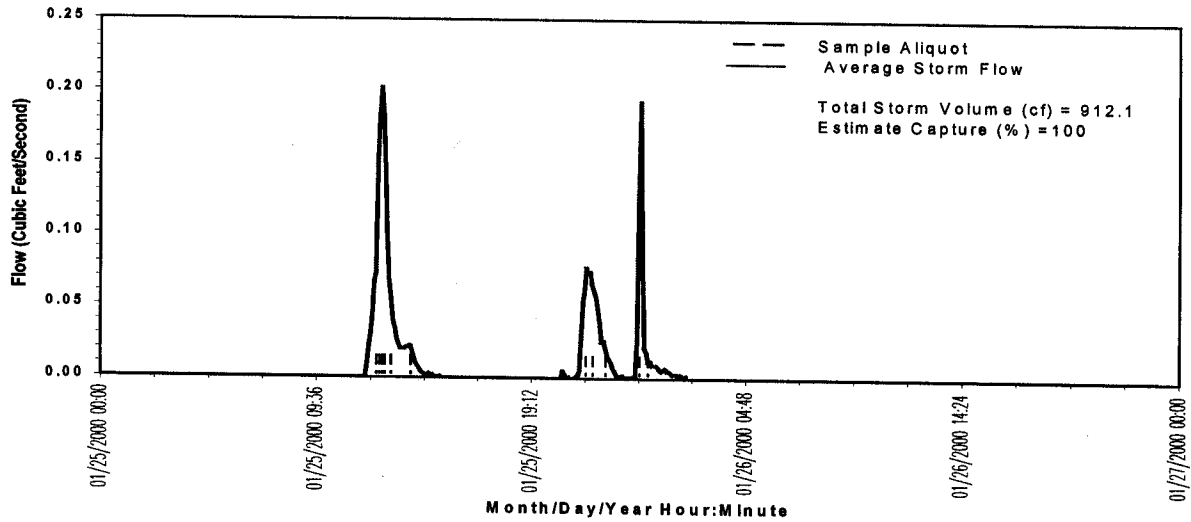
Hydrograph for Kearny Mesa Maintenance Station Effluent on 1/25 - 1/26/2000



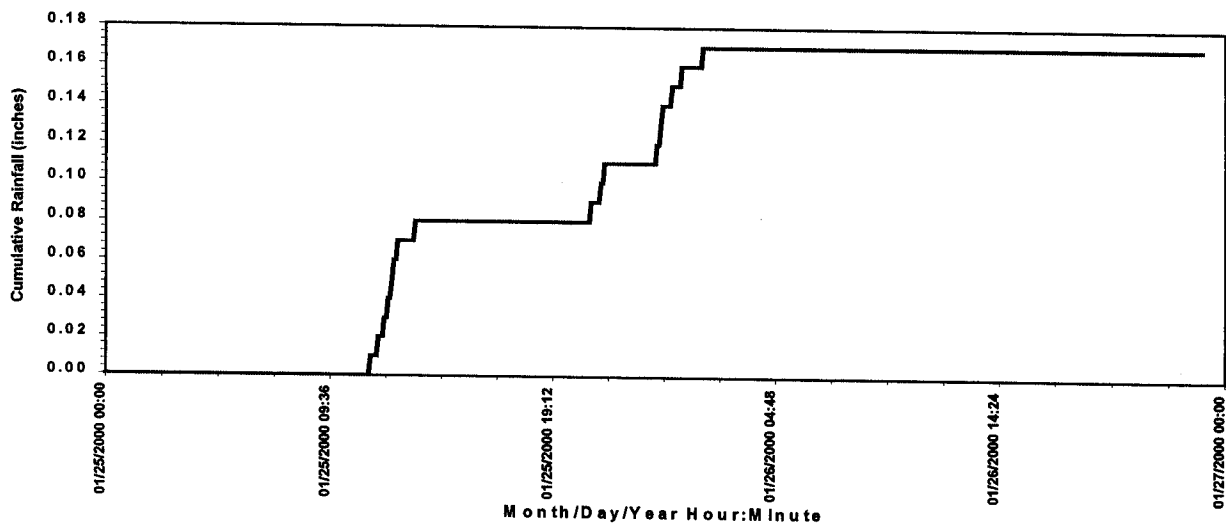
Hydrograph for SR 56/I5 Influent on 1/25/2000-1/26/2000



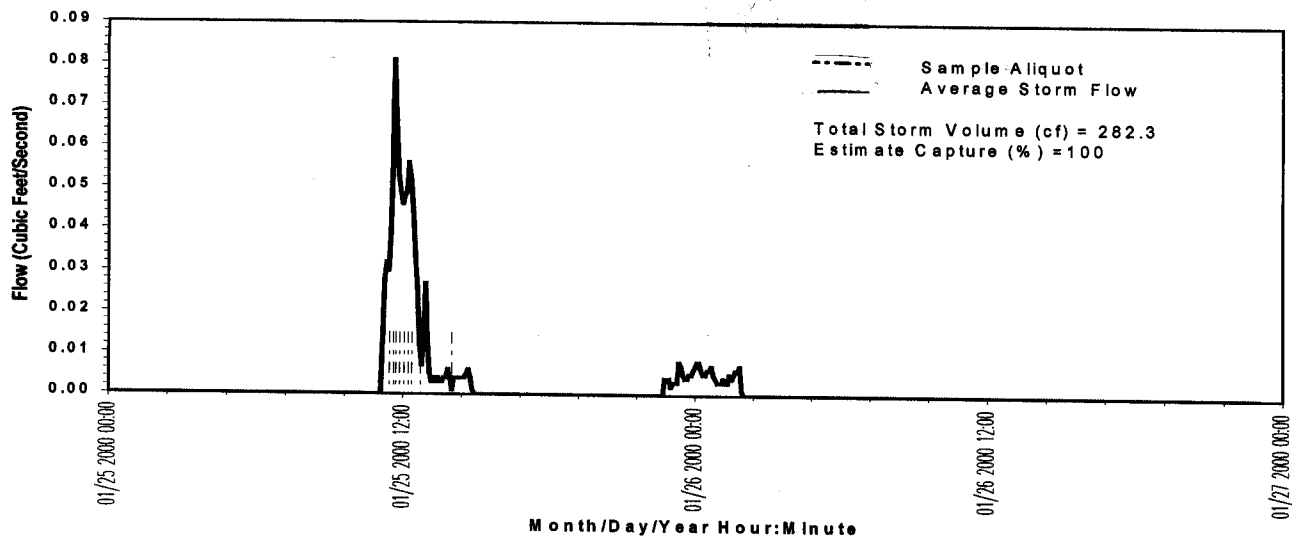
Hydrograph for SR 56/I5 Influent on 1/25/2000-1/26/2000



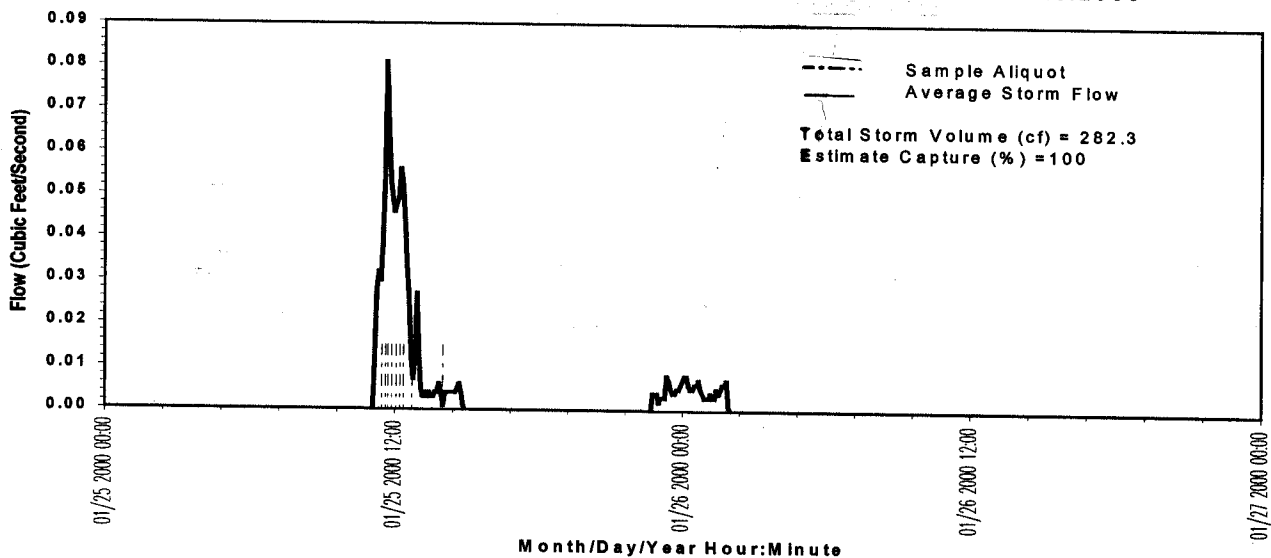
Cumulative Rainfall for SR 56/I5 Influent on 1/25/2000-1/26/2000



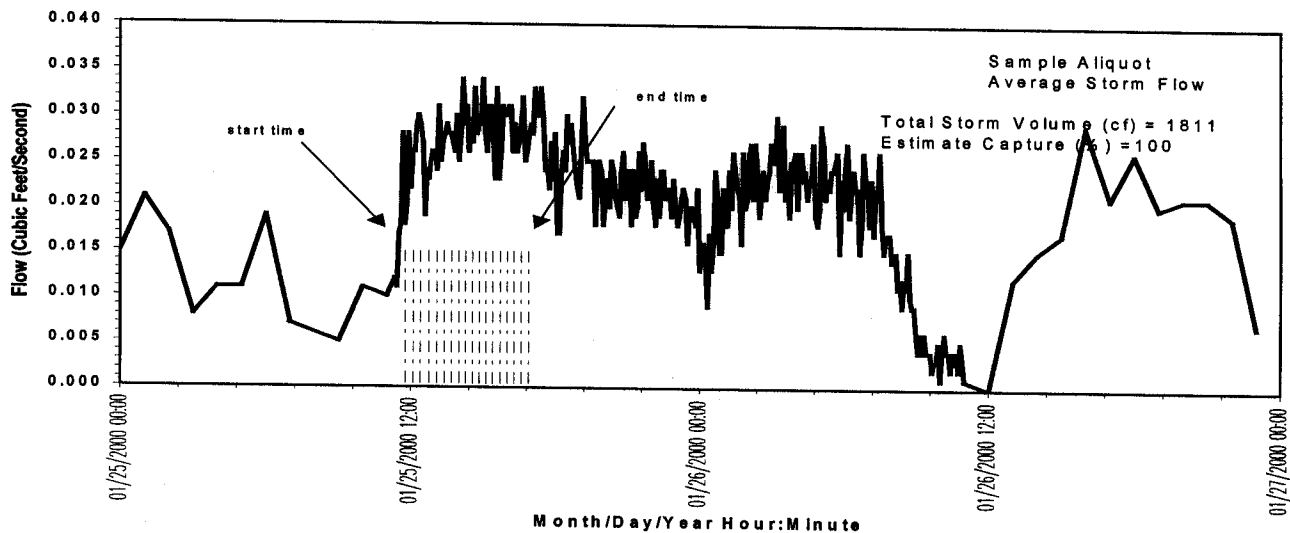
Hydrograph for La Costa Wet Basin Influent on 1/25/2000 - 1/26/2000



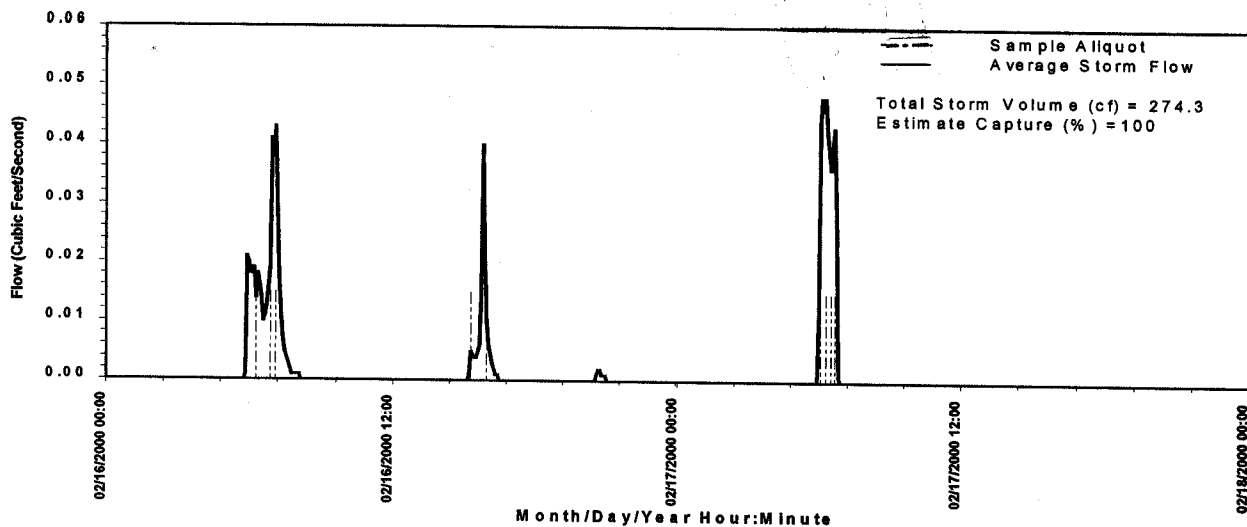
Hydrograph for La Costa Wet Basin Influent on 1/25/2000 - 1/26/2000



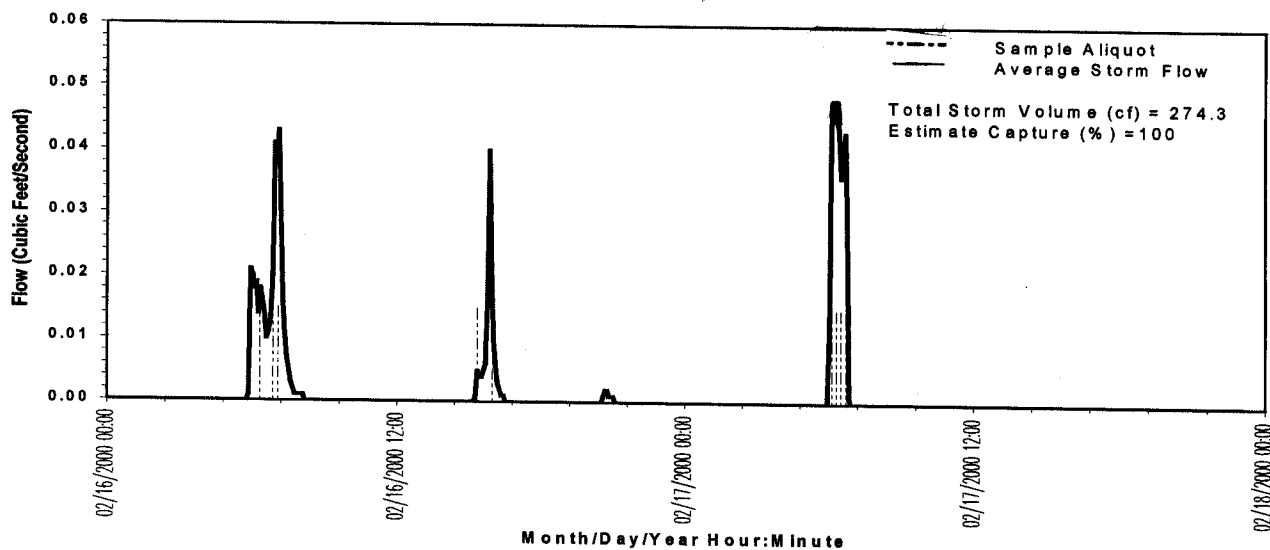
Hydrograph of La Costa Wet Basin Effluent on 1/25/2000 - 1/26/2000



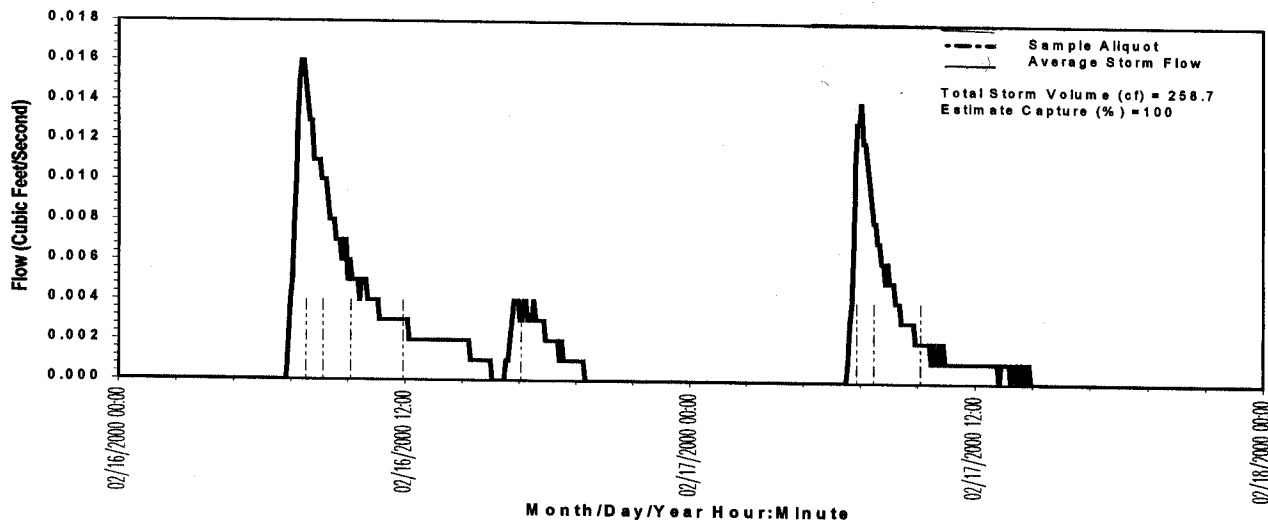
Hydrograph for SR78/I5 Park & Ride Influent on 2/16/2000 - 2/18/2000



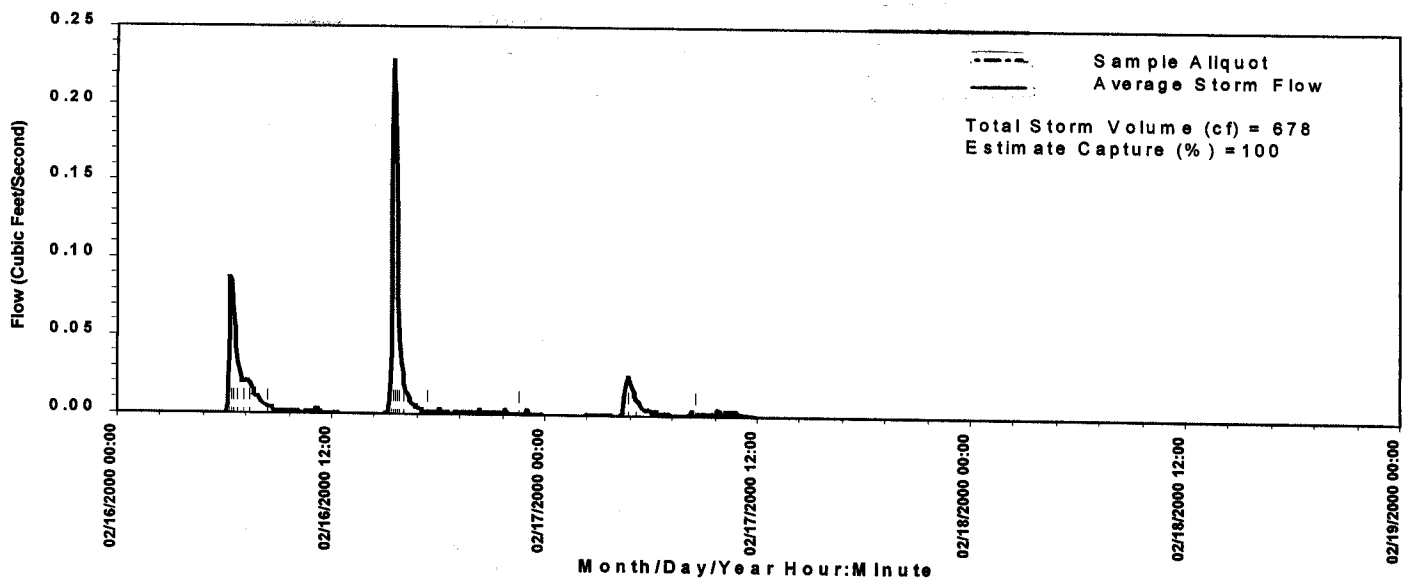
Hydrograph for SR78/I5 Park & Ride Influent on 2/16/2000 - 2/18/2000



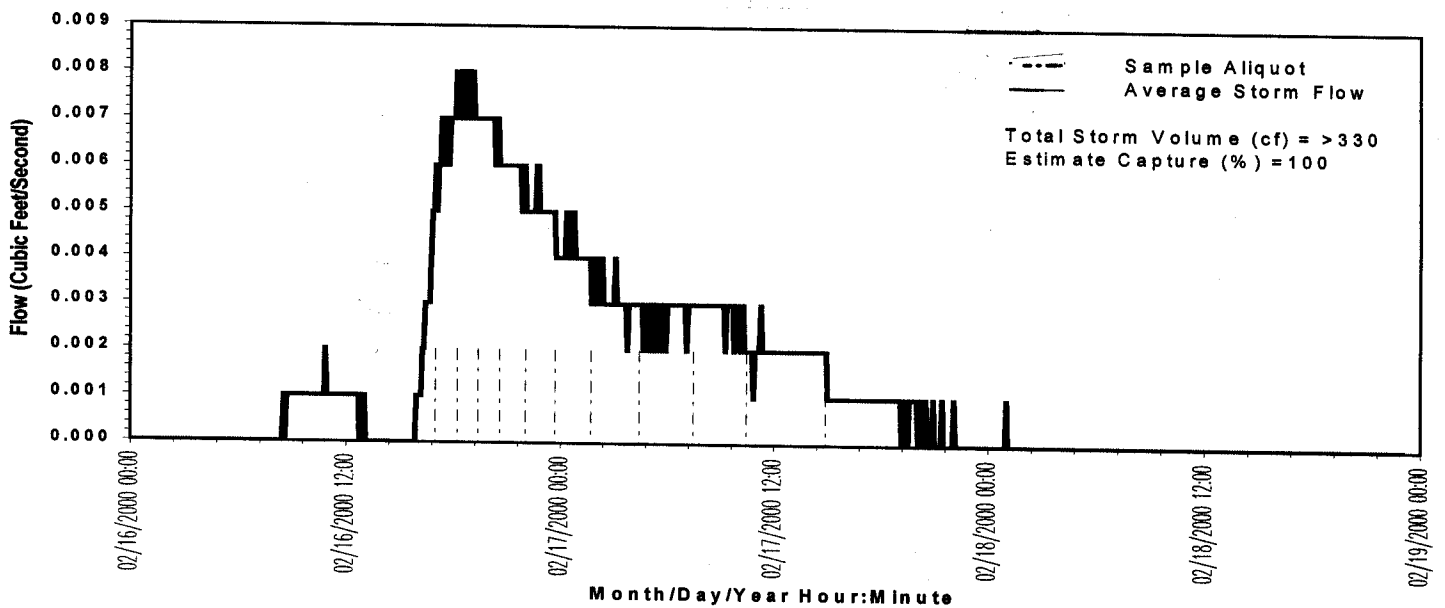
Hydrograph for SR78/I5 Park & Ride Effluent on 2/16/2000 - 2/17/2000



Hydrograph for La Costa Park & Ride Influent on 2/16/2000 - 2/18/2000



Hydrograph for La Costa Park & Ride Effluent on 2/16/2000 - 2/18/2000



Hydrograph for La Costa Park & Ride Influent on 2/16/2000 - 2/18/2000

